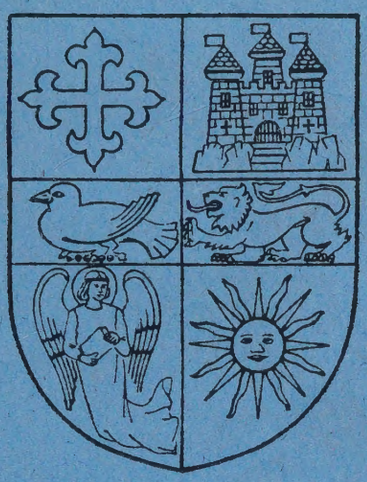
SOUTH-EASTERN REGIONAL HOSPITAL BOARD, SCOTLAND



THEATRE SERVICE CENTRE

Seven shillings and sixpence net.

PLATE 1

Theatre Service Centre Supervisor checking a large basic tray.

SOUTH-EASTERN REGIONAL HOSPITAL BOARD, SCOTLAND

THEATRE SERVICE CENTRE

Report of the Theatre Service Centre Committee on an experiment carried out in the Royal Infirmary of Edinburgh during 1964-65 on the design, equipment, and organization of a Theatre Service Centre.

11 DRUMSHEUGH GARDENS,
EDINBURGH, 3.

December 1965.

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FOREWORD

By Mr T. McW. Millar, F.R.C.S.E.

Vice-Chairman of the Board and Convener of the Board's Regional Planning Committee and of the Joint Planning Committee for the Royal Infirmary of Edinburgh.

At the present time many committees and planning groups are engaged in preparing the briefs for the new hospitals being planned or built throughout the United Kingdom—and indeed throughout the world. It is perhaps not generally realized how much work is involved and how many problems arise in the course of such an exercise. One of the problems is the design and method of functioning of a modern suite of operating theatres, and one of the aspects of this problem is how best to supply the surgeon and his team with instruments, dressings and other items which they require in the optimum condition as regards convenience, reliability, and, above all, sterility.

The South-Eastern Regional Hospital Board's Joint Planning Committee for the new Royal Infirmary of Edinburgh, which consists of representatives of the Regional Hospital Board, the Board of Management for the Royal Infirmary of Edinburgh and Associated Hospitals, and the University of Edinburgh, appointed a Working Party to consider this problem, and out of the Working Party's deliberations there emerged the concept that came to be called the Edinburgh Pre-set Trolley Top Tray System for supplying packs of sterile instruments and materials for each operation. That concept was accepted by the Joint Planning Committee, who recommended that a Central Theatre Supply Unit, based on the concept, should be provided in the new hospital. The Regional Board accepted this advice and agreed that an experiment should be set up to study the problems of such a centralized theatre service.

The Theatre Service Centre Committee was formed to conduct this study, and after much work has produced this report. As will be seen, the committee concludes that, to maintain the highest possible standard of sterile theatre instruments and dressings, supply from a central source and adequate inspection and maintenance by this central source is essential. It is claimed that the experiment has demonstrated the practicability of the method, and indeed the Centre has been supplying several theatres in the Royal Infirmary over a period of many months. It is pointed out that much detailed work has still to be done and the Regional Planning Committee has agreed that the service should continue and be extended to other theatres in the existing hospital.

The South-Eastern Regional Hospital Board has accepted this report and has agreed that it should be published, so that the great experience gained by the Committee and the mass of valuable information which the report contains may be made available to hospital authorities and hospital planners and to all who may be concerned in any way in the solution of the complex problems with which it deals.

December 1965. T. McW. Millar.

PREAMBLE

In presenting our report we have been conscious of the prime purpose of the experiment, viz. to advise the Joint Planning Committee on the various aspects of a comprehensive, centralized, theatre supply system, to enable the committee to formulate its plans for the construction of the new Royal Infirmary of Edinburgh. At the same time we recognize that the results of the experiment may have wider implications in respect of plans for other new hospitals in the South-Eastern Region and elsewhere, and also that the results may be of some assistance to others who are considering the introduction of such a system in existing situations. We have accordingly included in the report a considerable amount of detail that would not normally be necessary for the prime purpose.

Section I introduces the report and gives the background leading up to the establishment of the experiment.

Section II of the report describes the experiment in detail, and gives an account of the preliminary decisions that had to be taken concerning the operational procedure to be adopted, the adaptation of the accommodation, the layout of the equipment, and the organization and staffing of the service.

Section III describes the work flow within the Theatre Service Centre and the operating theatres.

Section IV gives an analysis of the results of the experiment, and includes comments by other people and departments on the effect that the service has had on their own work and on the work of their departments.

Section V contains our recommendations—both long-term and short-term. Our assessment is based on our own observations during the course of the experiment, a close examination of the work study and architect's reports, and the views of other people concerning a novel form of service superimposed upon an established service of long standing. We accept that in different circumstances and situations others may reach different conclusions, but we believe that the recommendations we submit are a reasonable and practical solution to the problem posed by the Joint Planning Committee and should assist it in its deliberations.

We have included in the appendices to the report much of the detail disclosed by the experiment. We feel that the detail may be of assistance to others as a baseline from which to plan further experimental work of this nature or as a guide to the introduction of a similar theatre service.

We should like in presenting the report to acknowledge with gratitude the assistance we have received from a large number of people, without whose help this experiment could not have been undertaken. Those who have assisted us in this way were co-opted to the Working Party, the composition of which is noted in Appendix I.

In compiling the report, we have drawn freely from a number of reports submitted by several people intimately concerned with the project. A list of individual contributors is given in Appendix 2. A Work Study Report, which we have also consulted, has been submitted separately by the Work Study Department of the South-Eastern Regional Hospital Board.

In our report we have mentioned the names of certain commercial firms; we have done so solely in the interest of ease of identification and description of certain types of equipment and material. This does not imply that we found such equipment and material as being the best or the only type for the purpose. We would stress that none of the firms mentioned has played any part in the conduct of the experiment, nor has any firm had any financial interest in it. We have, however, received technical advice from some of the firms, particularly with regard to the adaptation of equipment, for which we are grateful. We should also like to record our appreciation of the firms that met our extraordinarily large demands for equipment and materials, particularly instruments and linen, with the minimum of delay; we understand that our demands threw a big strain on their manufacturing and supplying departments, and their ready co-operation in meeting the demands and in replacing faulty materials is much appreciated. Without their co-operation the experiment could not have been concluded on time.

On behalf of the Theatre Service Centre Committee,

W. MACKIE.

J. H. BOWIE.

SECTION I

INTRODUCTION

1. In their recommendation that the new Royal Infirmary of Edinburgh should provide a central Theatre Supply Unit for the operating theatre suite, the Joint Planning Committee for the Royal Infirmary of Edinburgh advised the Regional Hospital Board to set up an experiment to study the problem of a centralized, comprehensive, theatre service. The theoretical advantages of such a service were well known, but the Joint Planning Committee felt that its recommendation lacked detailed information in support; it wished to obtain factual evidence of the organization, design, staffing, and financial implications of such a service.

2. In November 1963 the South-Eastern Regional Hospital Board appointed a Theatre Service Centre Committee under the chairmanship of Col. W. Mackie to conduct an experiment as advised by the Joint Planning Committee. The remit to the Theatre Service Centre Committee was in the following terms:—

> "To conduct an experiment in the technique of the *Edinburgh Pre-Set Trolley Top Tray System for the servicing of operating theatres and to report on matters relating to equipment, space requirements, and staffing, within six months."

3. The Scottish Home and Health Department accepted the need for an experiment of this nature, and accordingly provided a financial grant of £23,500 for capital expenses together with the estimated running costs involved in an experiment covering a period of six months.

4. The Theatre Service Centre Committee met on 20th November 1963, and outlined the general plan of the experiment. It decided that the routine development of the experiment would be best left in the hands of a Working Party, who could take a close active interest in the daily organization of the experiment. Sufficient authority was granted to the Working Party to develop the experiment along such lines as it thought profitable and to consult such persons as it thought could assist in the experiment. The Working Party was placed under the leadership of Lt.-Col. J. H. Bowie and it included the Chairman of the Theatre Service Centre Committee, who retained financial control of the experiment.

5. The Board of Management for the Royal Infirmary of Edinburgh placed Ward 4 of the Royal Infirmary at the disposal of the Theatre Service Centre Committee for the purposes of the experiment, but it was understood that, if the Board of Management decided to perpetuate the service after the experiment was completed, the accommodation would continue to be used for that purpose. The Theatre Service Centre Committee and its Working Party bore that possibility in mind in their decisions concerning structural alterations.

* The design and system of use of the Edinburgh Pre-set Trolley Top Tray System have been assigned by Lt.-Col. J. H. Bowie, Mr James Dick, and Mr B. G. Summers, to the Board of Management for the Royal Infirmary of Edinburgh and Associated Hospitals, which has applied for a patent in the United Kingdom, in order to safeguard the Infirmary, or any other medical user. Applications for commercial manufacture should be made to the Group Secretary and Treasurer, the Royal Infirmary of Edinburgh and Associated Hospitals, Royal Infirmary, Edinburgh, 3.

Section II

THE DESIGN OF THE EXPERIMENT

(*a*) Preparatory Work

6. At the initial meeting of the Theatre Service Centre Committee, it was intimated that the experiment should extend to five theatres. The Working Party was instructed to start with two general theatres and to bring the remaining theatres into service as the experiment progressed. The method of choice was to be the Edinburgh Pre-Set Trolley Top Tray System, whereby pre-set trays and packs of sterile instruments and materials are supplied for each operation. It was also decided that in the initial stages any theatre selected for service by the centre would retain its existing stock of instruments and linen till such time as service from the central source was fully established; thereafter the stocks would be withdrawn from the theatres by the Centre for use in bringing additional theatres into the scheme. The Working Party was instructed accordingly.

7. The members of the Working Party first met in November 1963. They divided into two groups. One group, consisting of the surgeons and the nurses, met at frequent intervals in order to determine as quickly as possible the required contents, sorts, and number of the standard trays and packs. They based their estimates for two theatres upon trial runs and upon a previous work study of surgical operations carried out in the 19 operating suites of the Royal Infirmary over a three-month period.

8. The remaining members of the Working Party concentrated upon the process of work entailed by the new centralized supply system. They were able to specify the equipment that would be required to make a start, and to decide upon the layout of the equipment in the Decontamination and Tray Assembly Area.

9. Costed lists of surgical instruments, utensils, dressings, drapes, and other equipment required for the Theatre Service Centre were, after acceptance by the Chairman of the Committee, recorded and passed to the Royal Infirmary for ordering by the Pharmacy, House Steward's Office, Engineering Department, and Works Department on the suppliers recommended by the Working Party.

10. Between February and July 1964 the surgical instruments were inspected as they arrived, and submitted in representative batches for the approval of the surgeons, who thereafter considered demonstration trays of instruments, utensils, drapes, and dressings.

11. Discussions were held by the Theatre Sisters and the Supervisor and Work Study Officer of the Theatre Service Centre to determine the most satisfactory procedure to be adopted.

12. During the preparatory phase, staff were recruited as required up to the estimated establishment. The training of tray assemblers in linen inspection, instrument checking, and tray setting was continued throughout that period.

13. Drapes were made in the Centre from linen purchased in bulk. The sizes of drapes were standardized to sizes agreed by the theatre staff.

14. Structural alterations were required in the ward provided as the Decontamination and Tray Assembly Area; electrical and plumbing services had to be provided to the appropriate points for the installation of the equipment. The wooden floor was sanded, stained, and sealed. A new door and covered entrance were required.

15. The preparatory phase commenced on 28th January 1964, but took longer to complete than had been at first anticipated. It was not possible to start the service till 1st August 1964. The service was extended to a third theatre on 9th December 1964, but delay in the supply of equipment prevented the extension of the service to the two remaining theatres before the conclusion of the six-month experimental period.

(*b*) Layout

16. The accommodation provided for the Theatre Service Centre comprises three areas, viz. a Decontamination and Tray Assembly Area in the ward allotted by the Board of Management; a Sterilizing Area consisting of one Drayton Castle high pre-vacuum dressing sterilizer, within the Central Sterilization Department of the hospital; and a Processed Stores Area, adjacent to the Sterilizing Area.

17. The Decontamination and Tray Assembly Area is 2,100 sq. ft. in floor area, but certain restrictions in layout were imposed by its shape (75 by 28 ft.). The original through passage from the ward to the main hospital corridor was closed, since the ancillary rooms associated with the ward at this point were used to house patients, and it was considered undesirable to permit incoming traffic to the Decontamination and Tray Assembly Area to pass these rooms. It was therefore necessary to make a new entrance into the Decontamination and Tray Assembly Area. The entrance leads by a covered way (Plan 1, item 28) to an existing open verandah (Plan 1, item 29), which opens on to the main hospital corridor, from which access can be gained to the Sterilizing Area, the Processed Stores Area, and the surgical theatres. The distance from the Decontamination and Tray Assembly Area to the Sterilizing Area and adjacent Processed Stores Area is 59 yards, and to the three theatres served, 161 yards (one floor up), 165 yards (one floor up), and 152 yards (two floors up), respectively.

18. The Central Sterilization Department of the hospital consists of a room containing five sterilizers. For the purpose of the experiment, one of these sterilizers was attached to the Theatre Service Centre. The Sterilizing Area is in direct communication with the Decontamination and Tray Assembly Area by " dictograph " machine.

19. The Processed Stores Area measures 20 by 13 ft., and is designed to hold sterile trays and packs in open shelving pending despatch to the theatres.

20. The sub-division of the Theatre Service Centre into functional areas and a list of the equipment provided for each area are given in Table I. While the function of each area can be clearly defined, the physical separation of one area from another is not so apparent; this has resulted from the restriction imposed by the shape of the ward used as a Decontamination and Tray Assembly

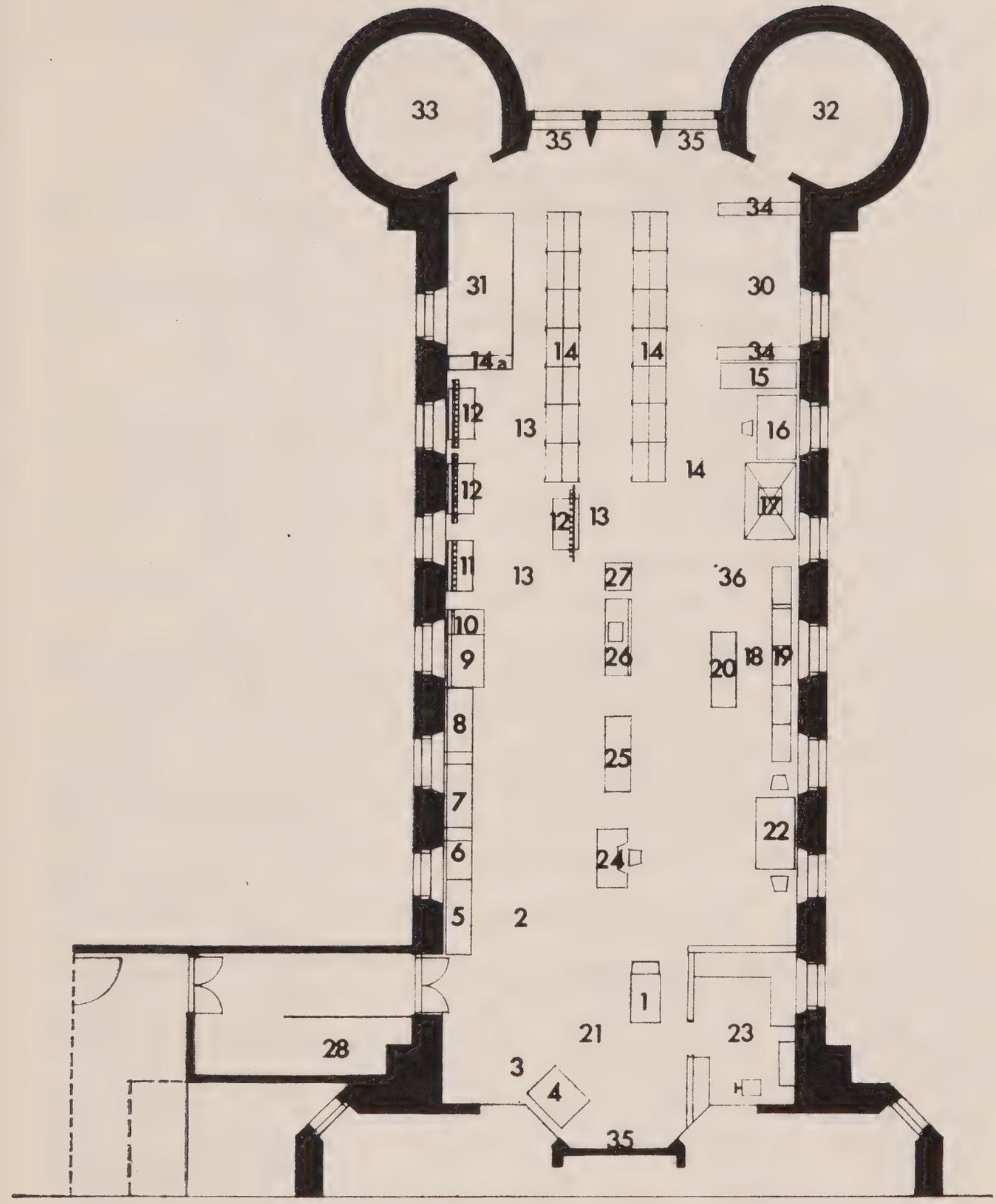
KEY TO PLAN 1

1. Cleaned soiled return truck ready to be taken to theatre on completion of next operation.
2. Soiled return truck unloading area.
3. Holding area for bags of laundry and used swabs (bags held here until instrument count completed).
4. Table for salvaged drapes and dressings.
5. Tray off-loading bench.
6. Transit-in bench.
7. Hobart washing machine.
8. Transit-out bench.
9. Ultrasonic cleaning cabinet.
10. Drying cabinet.
11. Inspection and sorting bench for half and quarter size tray sets of instruments.
12. Mobile sorting frame with 2 by 4 ft. full-size tray setting trolley.
13. Tray setting area.
14. Soft stores area and storage cupboards.

14*a*. Miscellaneous storage.

15. Linen folding trolley (parked while not in use).
16. Sewing machine table.
17. Linen inspection table.
18. Supplementary instrument, utensil, drape, swab, dressing, and gown packing area.
19. Extra storage space for (18) above.
20. Packing trolley for (18) above.
21. Holding area for prepared tray and pack trolley.
22. Work Study Officer's table.
23. Instrument repair workshop (not yet completed).
24. T.S.C. Supervisor's desk with telephone and " Dictograph."
25. Tray cleaning and storage bench.
26. Sink cabinet.
27. Steam heated boiler.
28. Bags of laundry and refuse in Laundry Collection Area awaiting disposal by portering staff.
29. Covered way connecting Decontamination and Tray Assembly Area with Sterilizing Area, Processed Stores Area, and surgical theatres.
30. Nurses' room.
31. Tray assemblers' room.
32. Female toilet.
33. Male toilet.
34. Stock instruments cupboards.
35. Storage area for stocks of dressings from manufacturer.
36. Laundry unpacking area.

The size of the Area is 2,100 sq. ft.



PLAN 1
DECONTAMINATION AND TRAY ASSEMBLY AREA

TABLE I

DETAIL OF EQUIPMENT FOR THEATRE SERVICE CENTRE RELATED TO FUNCTIONAL AREAS

	Equipment
A. Decontamination and Tray Assembly Area—	
1. *Truck Unloading Area:*	
(i) Holding Area for bags of laundry, etc.	1 Soiled Return Truck.
(ii) Drapes and Dressing Salvage Area.	1 Trolley, wooden, 48 by 24 in.
(iii) Tray Off-loading Area.	1 Bench, S.S., 72 by 24 by 34 in. high.
(iv) Tray Cleaning and Storage Area.	1 Bench, S.S., 72 by 24 by 31 in. high.
2. *Processing Area:*	
(i) Utensil Washing Area.	1 Sink Cabinet, S.S., 63 by 21 by 37 in. high. 1 Steam-heated Boiler.
(ii) Instrument Transit-in Area.	1 Bench, S.S., 49½ by 24 by 34 in. high.
(iii) Instrument Washing Area.	1 Hobart Washing Machine.
(iv) Instrument Transit-out Area.	1 Bench, S.S., 73½ by 24 by 34 in. high.
(v) Instrument Cleaning Area.	1 Ultrasonic Cleaning Cabinet. 1 Drying Cabinet.
3. *Tray Assembly Area:*	
(i) Half and Quarter size Tray Assembly Area.	1 Inspection and Sorting Bench, S.S., 71½ by 24 by 34 in. high.
(ii) Full size Tray Assembly Area.	3 Mobile Sorting Frames, 62 in. long by 56 in. high. 3 Trolleys, aluminium, 48 by 24 in.
4. *Supplementary Pack Preparation Area:*	2 Trolleys, wooden, 48 by 24 in. 4 Remploy Shelving Units, 39 by 24 by 72 in. high.
5. *Linen Repair Area:*	2 Trolleys, wooden, 72 by 24 in. 1 Linen Inspection Table, 72 by 48 in. with illuminated panel, 27 by 24 in. 1 Singer Sewing Machine. 1 Sewing Machine Table, 80 by 36 by 30 in. high.
6. *Prepared Tray and Pack Holding Area:*	2 Trolleys, wooden, 30 by 18 in.
7. *Storage Area:*	
(i) Instrument Storage Area.	4 Cupboards, 36 by 18 in.
(ii) Soft Stores Area.	30 Remploy Shelving Units, 39 by 15 by 72 in. high.
(iii) Dressings Storage Area.	2 Remploy Shelving Units, 32 by 24 by 72 in. high.

8. *Administrative Area:*	*Equipment*
(i) Office Area. (ii) Nurses' Room. (iii) Tray Assemblers' Room.	1 T.S.C. Supervisor's Desk. 1 Work Study Officer's Table. 1 Dictograph Intercommunication System. 6 Chairs. 2 Tables. 3 Clothes Lockers.
B. Sterilizing Area—	1 Drayton Castle High Prevacuum Dressing Sterilizer.
C. Processed Stores Area—	1 Cupboard, wooden, 19 ft. 8 in. by 5 ft. 9 in. high by 25 in. deep. Shelving, 11 ft. 4 in. long by 5 ft. high by 26 in. deep. 1 Dymo Tapewriter. 1 Sterilization Truck.

Area and the fact that one door serves as both an entrance and an exit. The general position of the functional areas and the distribution of equipment in the Decontamination and Tray Assembly Area are shown in Plan I, which should be read in conjunction with Table I. The layout was designed to provide a one-way system of traffic flow in a clockwise direction (Plate 2). A more detailed description of the major items of equipment with comments on modification and adaptation is given in Appendix 3.

(*c*) Theatre Equipment and Materials

21. The supplies to theatres comprise four main groups: linen, dressings, utensils, and instruments. These are provided in trays and packs, the composition of which was defined in collaboration with the theatre staff. Throughout the experiment, there was continued consideration and modification of the composition of the trays and packs. The list of contents shown in Appendix 5 represents the decisions reached at the conclusion of the experiment. It is probable that with experience further modification may be advisable.

(i) Linen

22. Linen is cut and hemmed in the Theatre Service Centre to standard sizes for use as patient drapes, tray covers, and pack wraps. Four different materials are used: green cotton, blue twill, green terry towelling, and red terry towelling. The green cotton and blue twill are standardized to five sizes, viz. extra large, large, medium, small, and small wrapper. In addition, three special articles, viz. leggings, thyroid drapes, and Mayo table covers, are supplied in green cotton. The two colours of terry towelling are each supplied in two sizes—large and small. The sizes and distinguishing code letters of the linen articles are shown in Appendix 4 (Section I).

23. Linen required for use as drapes is either included in the contents of trays, *vide* Appendix 5 (Section I), or detailed as supplementary linen packs, *vide* Appendix 5 (Section IV). Linen used as tray covers or pack wrappers is shown against the contents of each tray or pack in Appendix 5.

(ii) Gowns

24. Gowns are supplied in two sizes, large (60 in. length), and small (54 in. length). The contents of the gown packs are detailed in Appendix 5 (Section V).

(iii) Dressings

25. Dressings are provided as swabs, bandages, and other disposable materials, as specified in Appendix 4 (Sections II and III). The dressings are included in the contents of trays, *vide* Appendix 5 (Section I), or detailed as either supplementary and special dressing packs, *vide* Appendix 5 (Sections VII and VIII), or supplementary bandage packs, *vide* Appendix 5 (Section IX).

26. All swabs are supplied by the manufacturers (Vernon and Co. Ltd.) in standardized packs. Several types of swab packs are also asembled in the Theatre Service Centre. Supplementary bandage packs are assembled in the Theatre Service Centre.

27. Two types of disposable article were brought into use by the Theatre Service Centre. White plastic sponges are included as one of the components of the trays. $1\frac{1}{2}$ in. cubes of white plastic sponge (supplied by Campbell Brushes Ltd., Cromwell Street, Dudley, Worcestershire) are used instead of swabs for skin cleaning—prior to skin incision. After use in the operating room, the sponge and sponge forceps are discarded into the kick bucket. The sponges are prepared ready for use within the jaws of Rampley forceps (Plate 3), and are set on the trays by the tray assemblers. That arrangement has the advantage that no swab bundles in the standard set for the tray need be opened by the tray assembler—thus the swab count is not interfered with before the tray is in the hands of the scrub nurse. Further advantages are that the cost of a plastic sponge is one-third that of an ordinary swab, and surgeons prefer sponges for skin cleaning on account of the amount of antiseptic solution that the sponges hold and their slightly greater abrasive action as compared with a cotton swab.

28. The other disposable article that was introduced was a disposable suction pack. The pack is supplied sterile (Gamma rays sterilization) by Portland Plastics Ltd. of Hythe, Kent, at a cost of 4s. 6d. each pack. The pack wrappers consist of inner and outer heat-sealed plastic bags. The pack was developed in collaboration with the manufacturer, because we could find no economic method of cleaning any conventional design of metal sucker or tubing. The sucker is closed at the distal end, and within $\frac{3}{4}$ in. of this end there are six holes at different levels and aspects. The sucker is constructed of a hardish plastic tube $10\frac{1}{2}$ in. in length, with a slight bend $3\frac{1}{2}$ in. from the closed end, and has an internal diameter of $\frac{1}{4}$ in. The open end is attached to the 6 ft. length of soft plastic suction tubing, the internal diameter of which is $\frac{3}{8}$ in. The sucker can be converted into a sump-type sucker by enclosing it within a suitable length of plastic or rubber tubing, the internal diameter of which is

PLATE 2.—The Main Process Line.

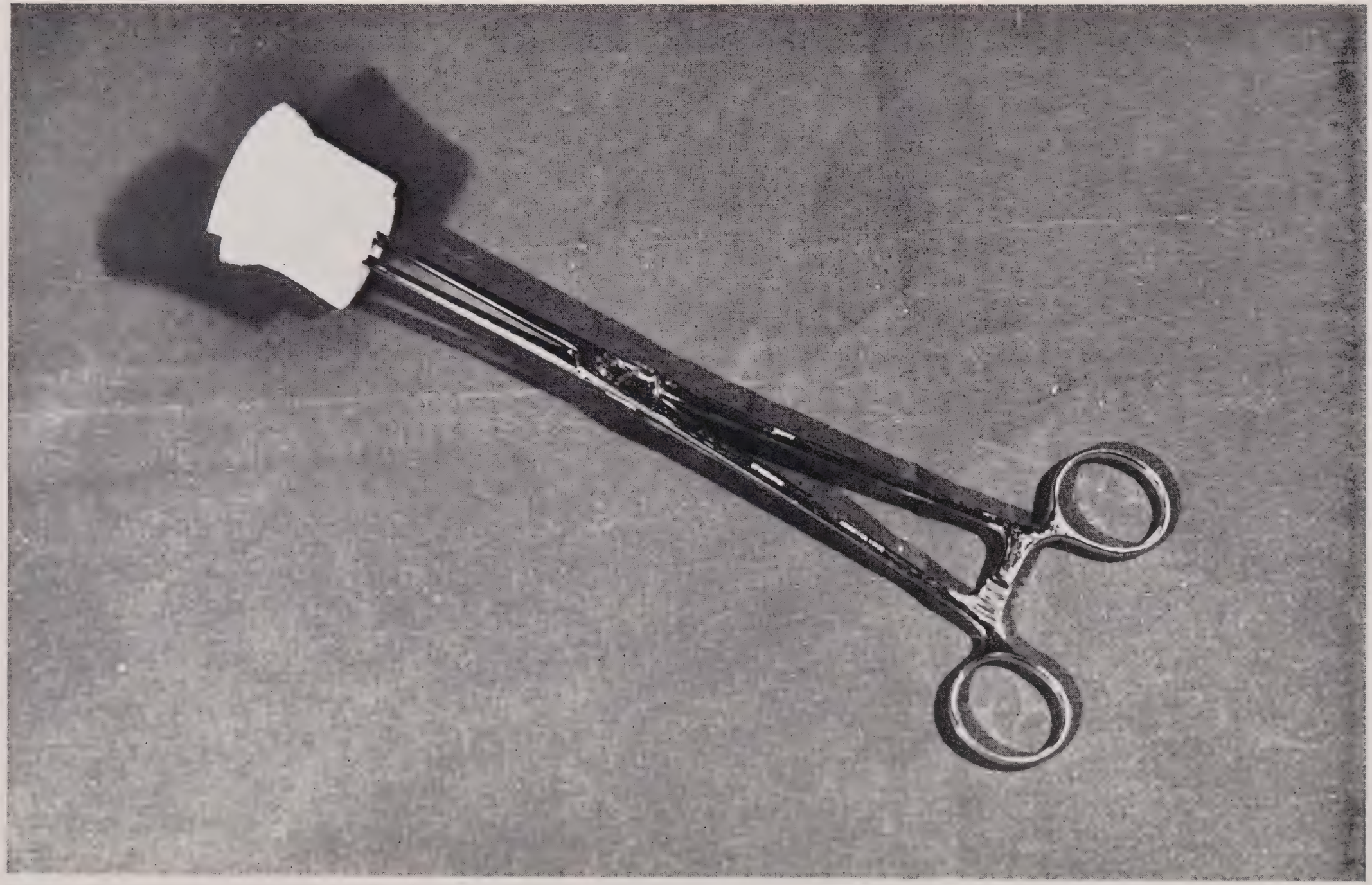


PLATE 3.—Disposable Plastic Sponge.

slightly greater than the outside diameter of the sucker. Since both wrappers (*i.e.* bags for the disposable sucker and tubing) are made of plastic, the aseptic removal of the inner from the outer bag is slightly difficult, but it is probable that a peel-pack arrangement will be devised for the outer bag.

29. A special dressing pack designated as a Burns Pack was introduced. The contents of the pack are shown in Appendix 5 (Section VIII). The pack was designed for use in conjunction with a dressing tray.

(iv) Utensils

30. Six varieties of theatre utensil are supplied as supplementary utensil packs. Initially stainless steel utensils were provided, but during the period of the experiment, polypropylene utensils were tried out and found to be satisfactory and are now being purchased in preference to stainless steel utensils. The suppliers are:

Basins—Capecraft, Warwickshire.
Bowls and Kidney Dishes—Industrial Mouldings (Warwick) Ltd.
Gallipots—Portex.
Jugs—Embee Products.

The contents of the utensil packs and the sizes of the utensils are shown in Appendix 5 (Section VI).

(v) Instruments

31. Instruments are provided as the main contents of pre-set trays and packs. The range of trays consists of three basic trays (large, medium, and small) and a number of supplementary instrument trays for special purposes designed for use either in conjunction with an appropriate basic tray or as a separate tray. The contents of all trays are shown in Appendix 5 (Section I).

32. In addition to the provision of set trays, supplementary instrument packs are supplied as a supplement to the instruments on the standard trays. For reasons of economy the packs are held either only in the Processed Stores Area and issued on request as Group 1 packs, or in theatre cupboards as well as in the Processed Stores Area as Group 2 packs. The probable degree of urgency dictates the appropriate grouping of the packs. The contents of the packs are shown in Appendix 5 (Section II).

33. In addition to the supplementary packs, it was also found necessary to provide special packs for use by particular individuals or firms. These are held in the particular theatre only and not in the Processed Stores Area. The contents of the special packs are shown in Appendix 5 (Section III).

34. The three basic trays are designed essentially for major, medium, and minor operations respectively. The intention was that each tray should contain all the instruments required for the exposure and dissection of the lesion and for the closure of the wound in those particular categories of operation. The original composition of the trays was altered during the course of the experiment on the basis of the actual usage of the instruments, drapes, swabs, and instrument packs provided; and the final content of the trays is based on

the experience of over 1,000 operations during the experimental period. It was decided that instruments that were required in only a proportion of the cases for which the tray was designed would be more economically included in supplementary packs, and that instruments required by an individual surgeon would be put into special packs retained in the theatre in which that surgeon operated. In that way, a considerable degree of standardization of instruments has been achieved, and respect for individual surgeons' idiosyncrasies has been maintained.

(*d*) Staff

35. By the beginning of August 1964 it was considered that the Theatre Service Centre was sufficiently well staffed and the staff adequately trained in their duties to allow a start being made on the six months' experiment. The staff consisted of a well-qualified theatre-trained sister appointed as Theatre Service Centre Supervisor, a part-time secretary, a part-time chargehand sterilizer attendant, two full-time tray assemblers, and one full-time seamstress.

36. The tray assemblers were domestic staff employed in the theatres as Group I domestics. They underwent a probationary period in the Theatre Service Centre; when considered proficient in their duties they were upgraded to Group IV.

37. In November 1964 the staff was strengthened by the appointment of a staff nurse as Deputy Supervisor and two part-time tray assemblers.

PLATE 4.—Soiled Return Truck. *Left*—Stapled laundry bag. *Middle*—Two used trays on shelves. *Right* (*above*)—Salvaged linen and swabs. *Right* (*below*)—Basin with plastic bag containing the used swabs.

Section III

THE SUPPLY SYSTEM

(*a*) Supplementary Supply

38. Each theatre maintains a fixed stock of supplementary linen packs, gown packs, swab packs, bandage packs, and one burns pack. The theatre stock is replenished at regular intervals from the Processed Stores Area without demand, but urgent requests are complied with immediately.

(*b*) Main Supply

(i) Elective Surgery

39. Each surgical charge in the Royal Infirmary has its own theatre suite.

40. During the afternoon preceding elective surgical sessions each theatre sister provides the Centre Supervisor with a list of the operations to be performed and the number of trays, supplementary and special instrument packs, and basin and other utensil packs required for each operation. The list shows the time at which the session is expected to start, and the order in which the operations are expected to be carried out. Before the session starts, trays and packs for the first case in each theatre are delivered in a sterilization truck by a sterilizer attendant from the Processed Stores Area. After the first operation has begun he delivers the requirements for the second operation on the list—as detailed to him by the Centre Supervisor.

41. At the end of each operation the Theatre Service Centre is informed of the fact by the theatre staff through the direct telephone link (" Dictograph "). The Centre is also informed of any supplementary or special instrument packs that were taken from the theatre stock and of any trays or packs that were ordered but not used. A sterilizer attendant tops up the stock of theatre instrument packs from the stock held in the Processed Stores Area, collects unused trays and packs, and returns them to the Processed Stores Area.

42. Where a patient has been returned to a ward with an instrument attached for some special purpose the Theatre Service Centre is informed that this has been done and is given the name of the patient, the ward number, and the type of instrument.

43. At the end of an operation a tray assembler leaves the Centre with a clean soiled return truck for the collection of the equipment used during the operation (Plate 4). Prior to folding over the inner and outer covers of the used trays ready for removal from the operating room the scrub nurse disposes of the contents of the gallipots from each tray, pushes the used instruments to one side (so separating them from the unused instruments), and collects in a kidney dish the knife handles (with blades still attached), broken glass vials, and atraumatic suture needles. At the theatre, the tray assembler loads the stapled paper laundry bag (boldly marked " T.S.C." by the manufacturer), used trays, salvaged drapes and dressings, empty hand basins, and the plastic bag of soiled swabs into the purpose-designed compartments of the soiled return truck. The tray assembler arrives back at the Centre with the truck about 10 minutes after leaving for the collection.

44. On return to the Centre the tray assembler removes the laundry bag and marks it with the theatre number and the serial number of the operation in that particular theatre, so that the bag may be identified later if an instrument is found to be missing. It is important that the tray assembler should confirm with the Centre Supervisor that the serial number of the operation is correct, since only the Supervisor may be aware that the sequence of operations on the list has been altered. The tray assembler removes the salvaged drapes and dressings to a table, from which they will later be redistributed to their appointed places in the Soft Stores Area. The polythene bag of used swabs is stapled to the laundry bag and placed in the Laundry Holding Area till the instruments have been cleaned and re-set on the tray or trays used during the operation. If the loss of an instrument is not detected at the Off-Loading Bench it certainly will be detected while the instruments are being re-set. When an instrument is found to be missing, the laundry bag used during the particular operation and the attached plastic bag of used swabs are searched. Instruments are quite frequently found in the laundry bag, but, during the six months' experiment, on only three occasions have instruments had to be reported to the theatre as lost—a pair of scissors, a Mayo artery forceps, and a Crile's artery forceps.

45. When the instruments have been re-set and it is clear that the numbers are correct, the laundry bags are placed in the Laundry Collection Area and the polythene bags deposited in a bitumen bag ready for incineration.

46. The trays from the soiled return truck are placed on the off-loading bench and the covers opened out. The used knife blades, broken glass, and atraumatic needles are deposited in a box kept for the purpose. The hand basins, together with sharp instruments such as scissors, amputation knives, and skin hooks, which might be damaged in the washing machine, are placed in the sink to be washed and dried by hand. The unused instruments are loaded into the first basket and the used instruments into as many further baskets as may be necessary. Instruments such as probes and nerve hooks, which might drop out of the basket during its jerking journey through the mechanical washing machine, are thrust through plastic sponges to keep them within the basket. Jointed instruments are opened widely. The baskets are placed within the special frames designed to move through the Hobart machine. The baskets themselves are designed to fit the compartments of the ultrasonic cleaner, the final hot water rinse tank, and the chamber of the drying machine.

47. There may be as many as four instrument baskets per surgical operation and sometimes trays arrive at the Centre in rapid succession from different theatres. In order, therefore, to distinguish instruments used at one operation from those used at another, a labelling system has been devised. Above the tray off-loading bench there is a board, on which hang groups of four metal discs for each operation (Plate 5). The discs are marked with the theatre suite number and the serial number of the operation on the list for the particular theatre. As each basket is loaded with instruments an appropriate disc is hooked on to the rim of the basket and is left there till the instruments have been removed from the basket for re-setting at the end of the processing line. The professional nurse removes the discs from the tray after her check of the re-set tray; the discs are then returned to the board above the tray off-loading bench.

48. In turn, the loaded baskets in their frames are pushed by the tray assembler from the transit-in bench into the cold jet rinse compartment of

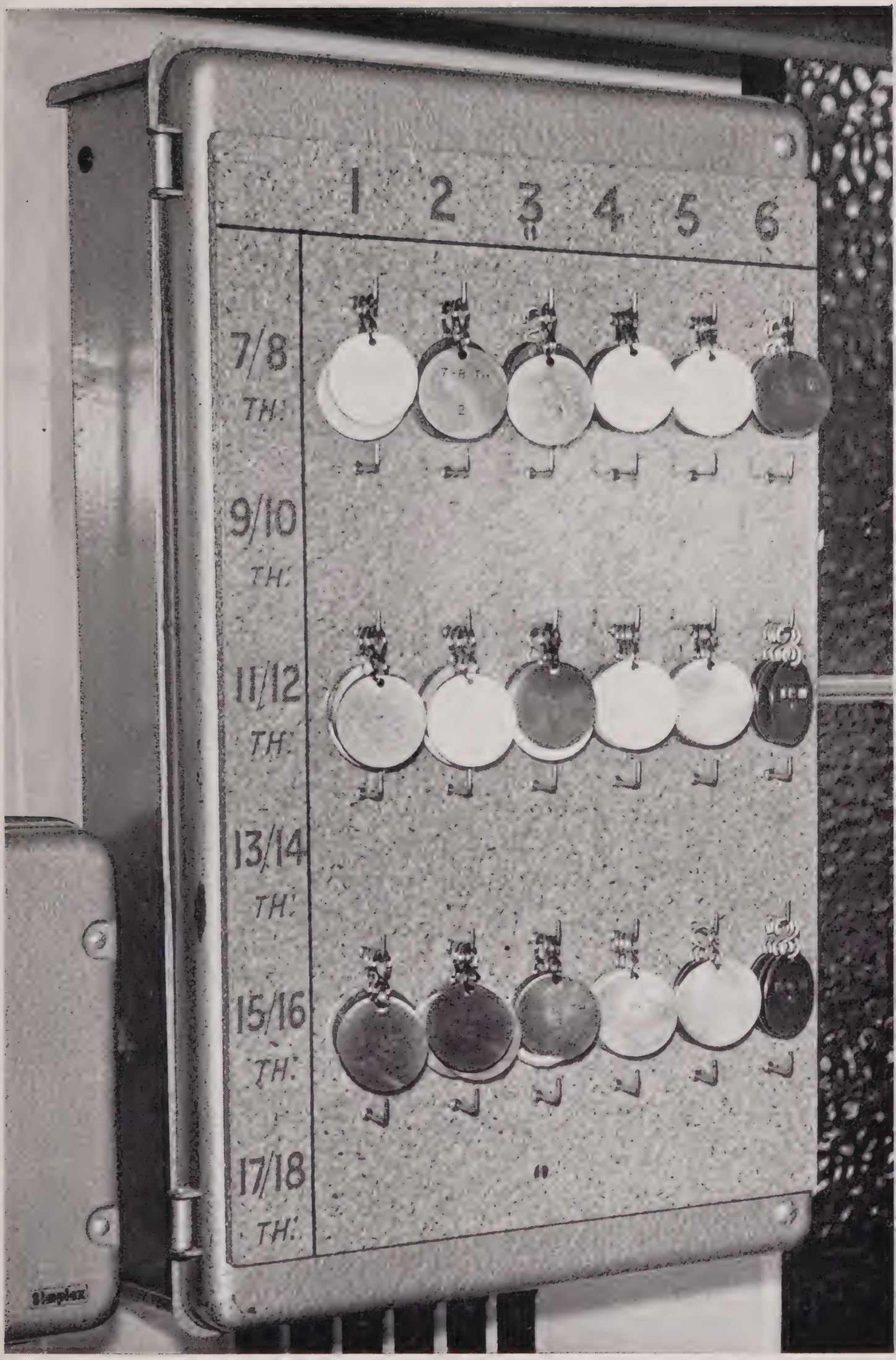


PLATE 5

Instrument Basket Identification Discs.

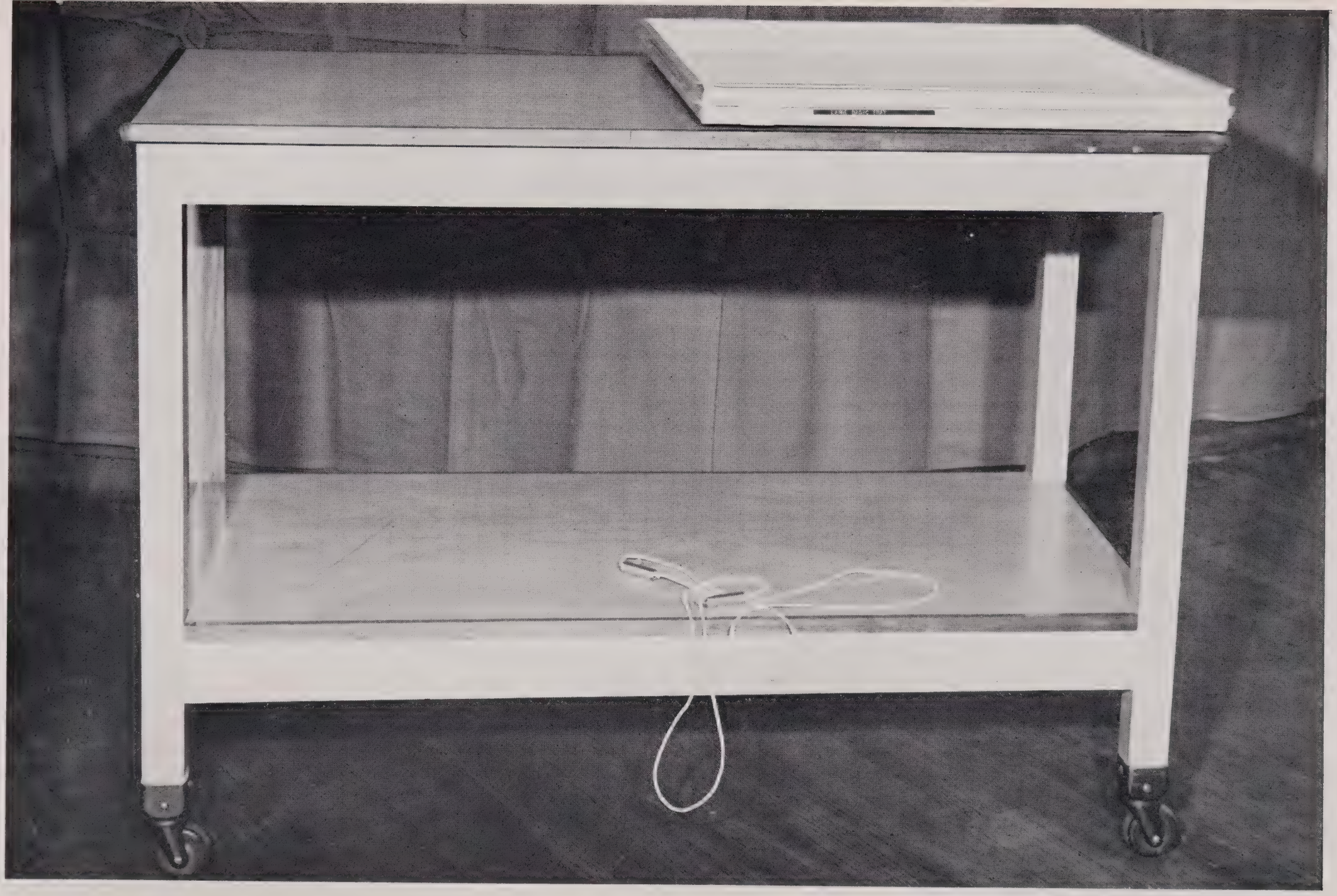


PLATE 6.—Full-size Tray on Trolley. (Spring retaining cord on shelf below.)

PLATE 7

Mobile Sorting Frame. (Tray assembler setting a full-size tray.)

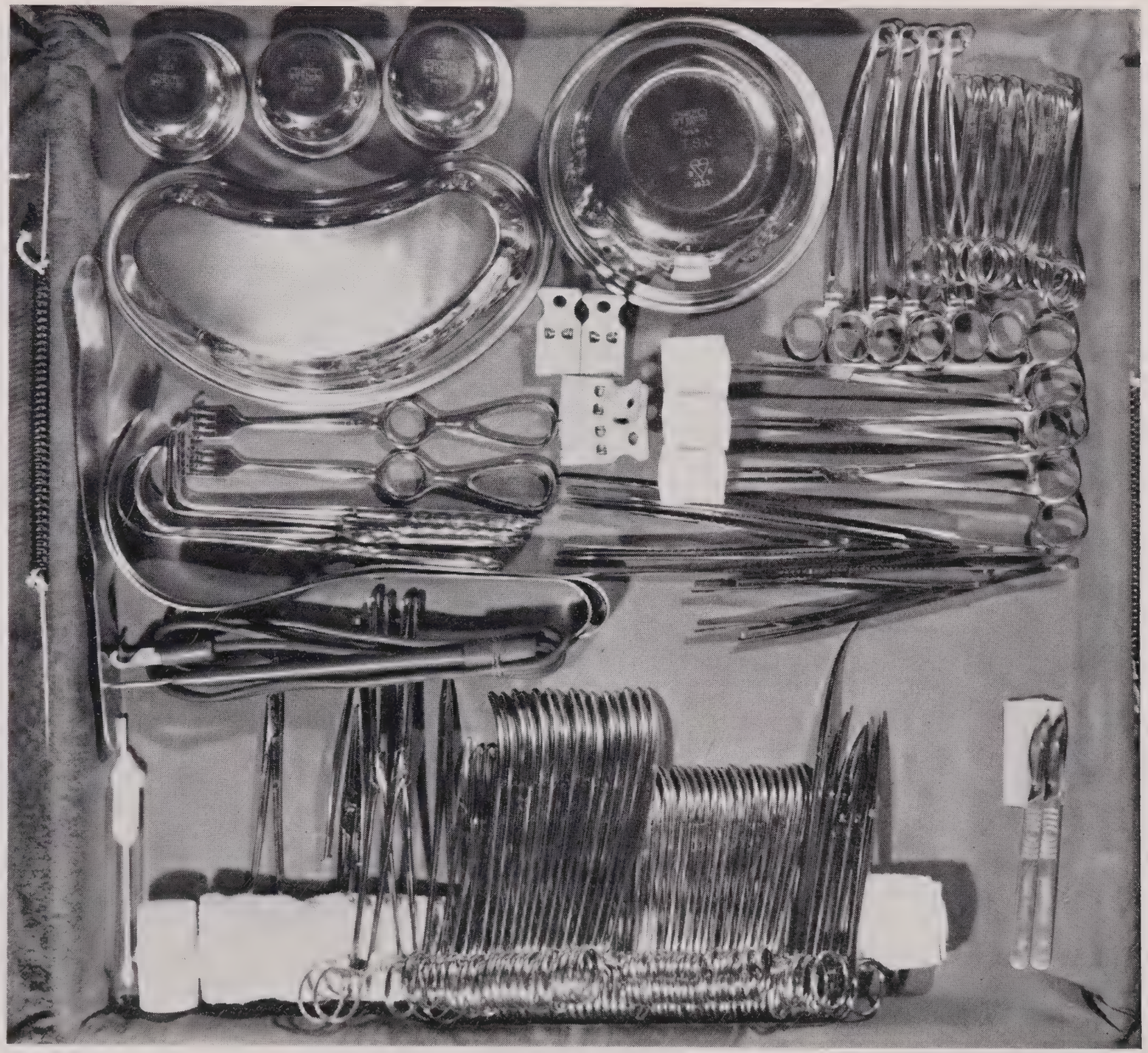


PLATE 8.—Instrument Set for Large Basic Tray.

the Hobart washing machine. Dirty instruments are left in the cold jet rinse for two minutes before being pushed onwards into the hot jet (160° F.) detergent rinse for two minutes by the introduction of the next frame into the cold jet rinse. The introduction of a third frame at the cold jet rinse end of the washing machine pushes the first frame on to the automatic ejector, which brings the first frame through the final hot jet rinse (190° F.) in 10 seconds and discharges it from the washing machine on to the transit-out bench. From the transit-out bench the frames are returned to the off-loading bench, and the baskets are held for their turn in the ultrasonic cleaning tank. After five minutes in the cleaning tank the baskets are immersed (dunked) three or four times in the hot water (200° F.) rinsing tank and then placed in the drying cabinet for up to five minutes. The cleaning process from the start at the washing machine to the end of the drying period occupies approximately 15 minutes.

49. During the instrument cleaning and drying process the tray assembler places the used tray covers in a laundry bag, washes her hands, and damp dusts the soiled return truck with 85 per cent. isopropyl alcohol. She then damp dusts the trays at the tray cleaning and storage bench and takes the trays together with their-spring retaining cords to the trolley setting area, where she selects a trolley of appropriate size—4 by 2 ft. for a full-size tray (Plate 6), or 30 by 18 in. for a half-size or quarter-size tray. The tray assembler places the tray on the trolley with the handles pointing away from where she will be standing as she sets the instruments in the tray. She arranges the blue outer and green inner tray covers over both the tray and trolley. The covers are pushed down into the tray by means of a wooden mould of appropriate size for the tray. The spring-retaining cord is stretched over the covers into the gutter round the upper outer aspect of the tray. The mould is then removed.

50. As instrument baskets are taken out of the drying chamber they are divided into two streams according to whether the instruments belong to sets to be assembled (1) in full-size trays or (2) in half or quarter-size trays.

51. For full-size trays a spare 2 by 2 ft. tray is placed on the prepared trolley to one side of the covered tray; the baskets are placed on the spare tray to prevent possible drips from the basket wetting the tray covers. A mobile sorting frame, with pegs for the finger ring instruments and a shelf for the drapes and dressings, is wheeled into a convenient position behind the 4 by 2 ft. trolley (Plate 7). Standard sets of drapes, swabs, and dressings for the particular tray are brought from the soft stores area and placed on the shelf. The inspection, testing, and sorting of instruments is carried out by the tray assembler. Instruments found defective are shown to the Supervisor, and replacements are taken from the stock instrument store cupboards. Any stiff-jointed instruments are immersed for a few minutes in " Instrument Lube "—a water-soluble lubricant supplied by Down Brothers and Mayer and Phelps Ltd., Church Path, Mitcham, Surrey. Defective instruments are given to the instrument curator for repair.

52. The tray is set according to the standard photograph for the particular tray (Plate 8). The jaws of all jointed instruments are opened before they are set.

53. The Supervisor or her deputy checks the instruments and utensils according to the standard list for the tray (Plate 1). She then removes the sets

of dressings (Plate 9) and drapes from the shelf of the mobile sorting frame and checks them according to the list as she packs them in a standardized method of distribution on top of the instruments in the tray (Plate 10). The tray label stuck on below the handles is checked. The sorting frame is wheeled away to allow the inner and outer tray covers to be folded over and stuck down with autoclave tape (Plate 11). The tray is then placed in the prepared tray and pack holding area to await removal by a sterilizer attendant. After the trays and packs have been sterilized (Plate 12), they are placed on one or other of the appropriate shelves in the Processed Stores Area.

54. After they have been dried, instrument baskets for half and quarter-size trays are placed on the inspection, testing, and sorting bench. On completion of sorting, a 30 by 18 in. trolley (with the tray, covers, and retaining spring cord in position) is brought up to the bench, and the instruments, utensils, dressings, and drapes are assembled in the standard fashion for the particular tray. The tray is then checked, covered, and disposed of in the same way as for full-size trays.

55. It is proposed to discard the inspection, testing, and sorting bench for half and quarter-size trays, because it causes a bottleneck in the process line. However, a mobile replacement has not yet been developed.

56. Following the assembly of instruments in trays additional instruments are left in the instrument baskets if supplementary or special instrument packs have been used during the operation. These instruments are sorted, inspected, checked, and placed in groups on the packing trolley (No. 20 in Plan 1) ready for re-assembly.

(ii) Emergency Surgery

57. For emergency surgery, a theatre without an elective list for that day "waits." For the purpose of this report, a day and a night are considered as two waiting sessions from the supply point of view. Sometimes a waiting theatre performs an elective surgical operation in addition to the emergencies for which it is waiting.

System while the Centre is open

58. The Centre is at present open on week-days from 7.30 a.m. to 8.30 p.m., on Saturdays from 7.30 a.m. to mid-day and is closed on Sundays.

59. For emergency operations during open hours the waiting theatre notifies the Centre of the trays and instrument packs required for each operation; the whole procedure of clean supply and soiled return is the same as for elective surgery.

System while the Centre is closed—Weekdays

60. At 8 p.m. an empty soiled return truck and a sterilization truck containing the following trays are delivered to the waiting theatre:—

2 Large Basic Trays.
4 Medium Basic Trays.
1 Small Basic Tray.
1 Catheterization Tray.
1 Dressing Tray.
1 Gastro-Intestinal Anastomosis Tray.
1 Lane's Straight Clamp Pack.
1 Swanson's Clamp Pack.
7 Basins.

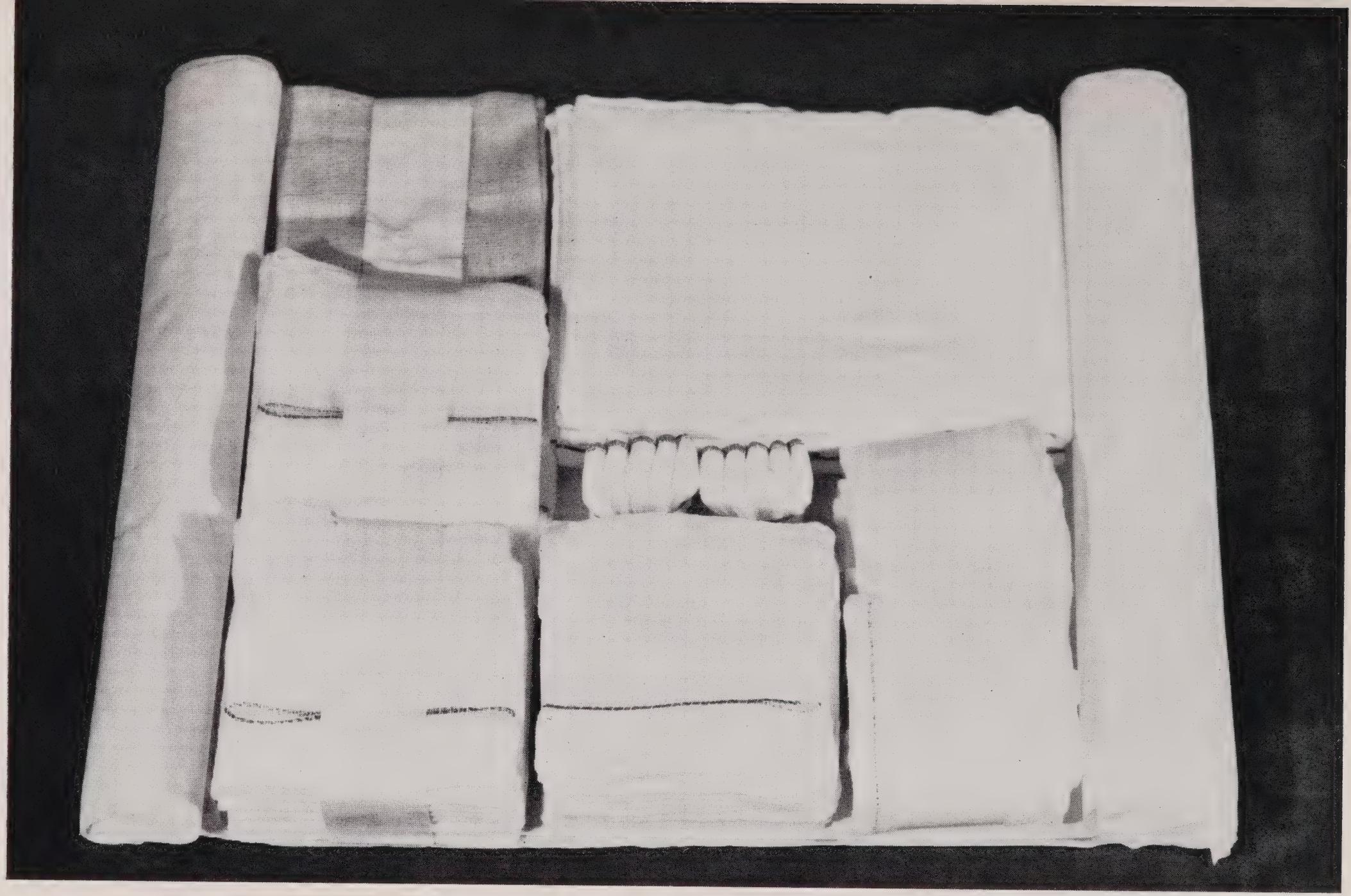


PLATE 9.—Swabs and Dressings Set for Large Basic Tray.

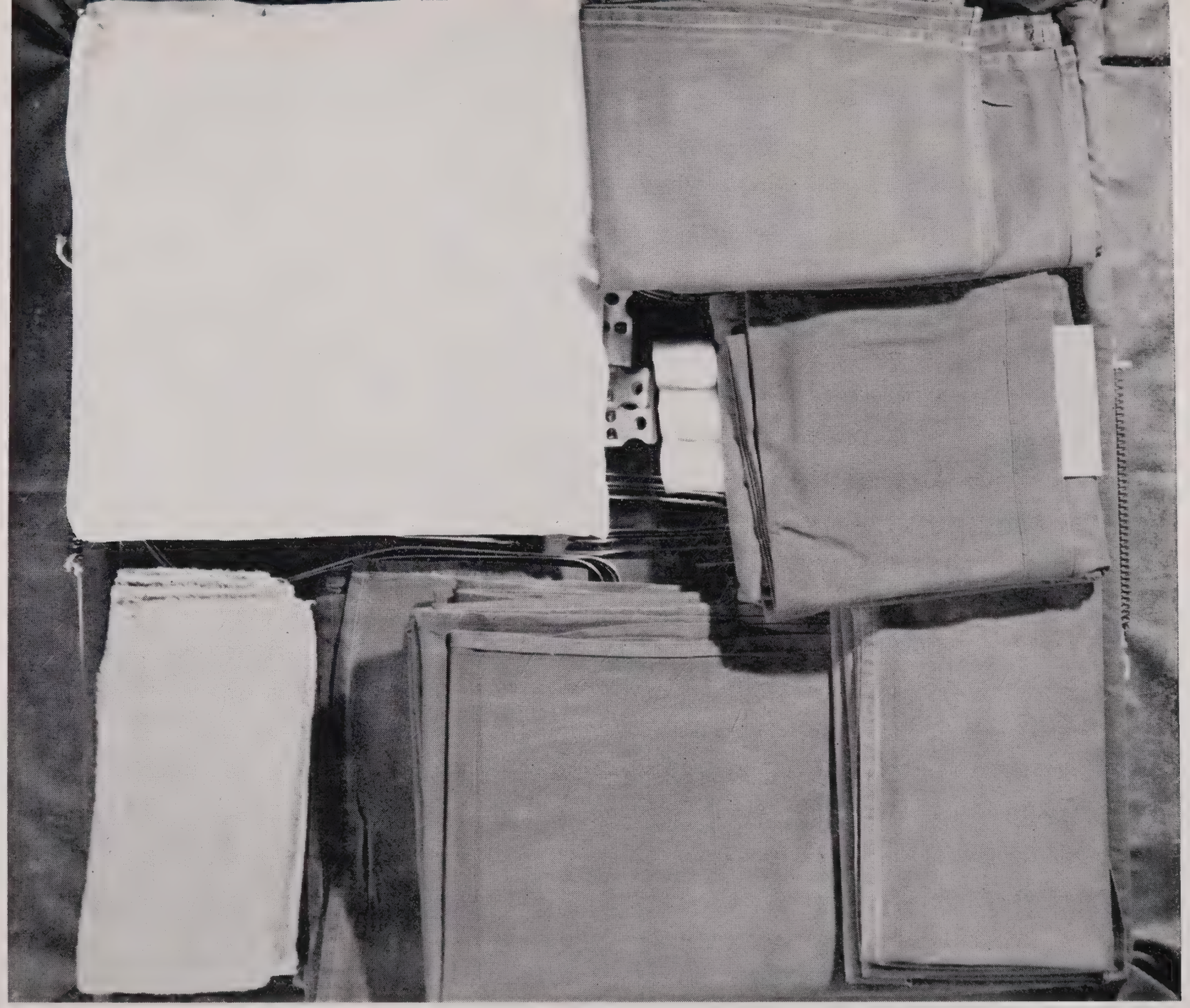


PLATE 10.—Drapes Set for Large Basic Tray.

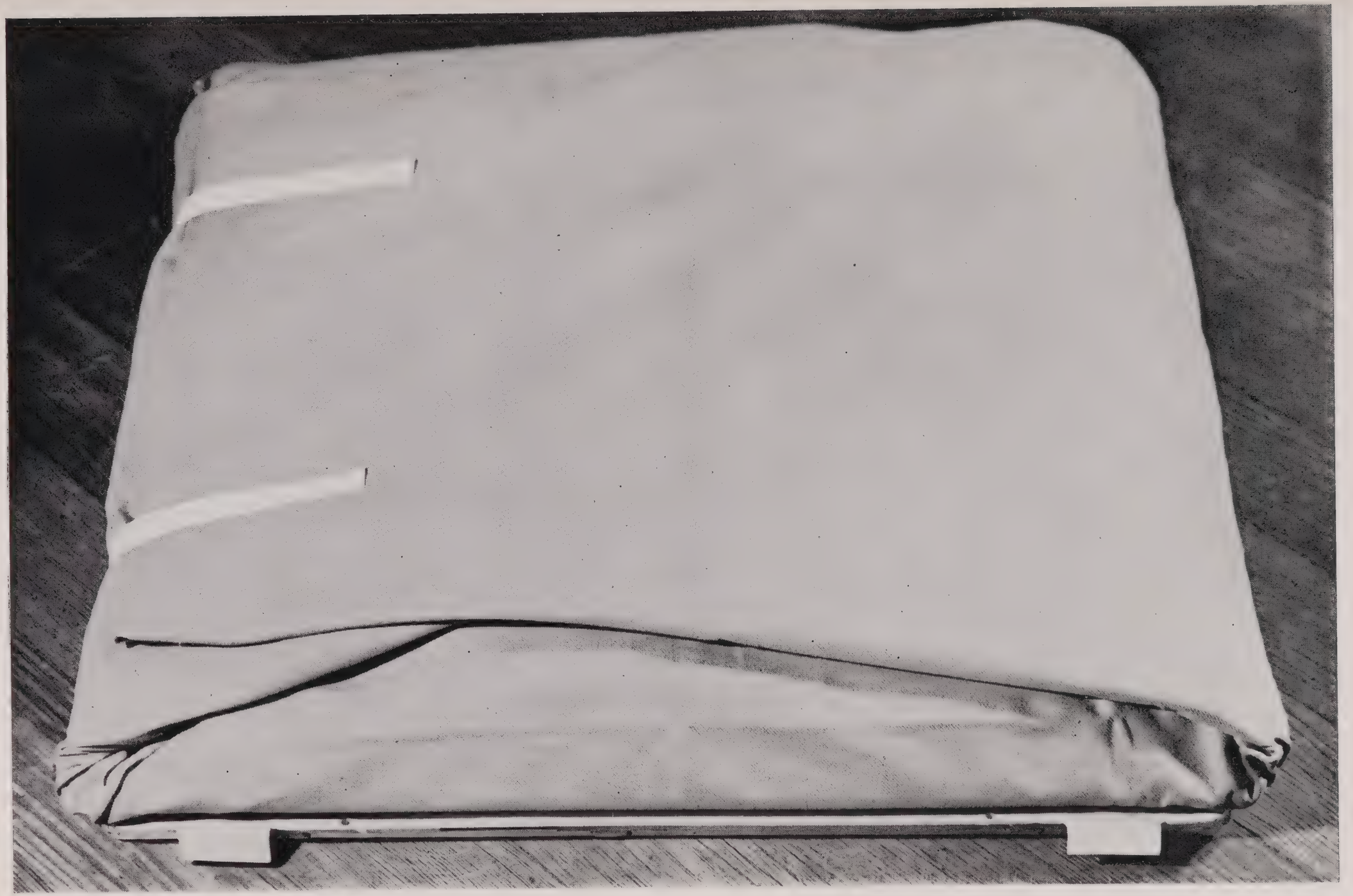


PLATE 11.—Large Basic Tray (packed).

PLATE 12

Sterilization of Trays.
(Note condensation drain below each shelf.)

For any further requirements the nurse in charge of the waiting theatre has a key to the Centre Processed Stores Area. She leaves a note for the Centre Supervisor of any trays or packs removed from the store during the night. The contents of the truck for emergency operations during the night are already known to be insufficient and the list of trays and packs for the truck is at present under revision.

61. On completion of each operation during the night, tacky labels showing the serial number on the emergency operation list are attached to the used trays and swab bag; the laundry bag is marked with the serial number of the operation and the number of the theatre. The trays and bags are then loaded into the soiled return truck. Particulars for each operation are given on the following form; the form is placed in the soiled return truck at the end of the night session.

THEATRE SERVICE CENTRE

Record of Trays used for Emergency Operations

THEATRE DATE

1. Please mark the outside of the laundry bag with the operation number.
2. Attach a tacky label bearing the operation number to the appropriate tray(s) and soiled swab bag.
3. Complete the following record for each operation:—

Op. No.	Operation	Tray Used	Supplementary Tray(s)	Instrument Packs

62. The sterilization truck and the soiled return truck are collected from the waiting theatre by the sterilizer attendant and the Centre staff respectively in the morning at 7.45 a.m. Thereafter the procedure for cleaning, re-setting, sterilization, and storage of the trays and packs is the same as for elective surgery.

System on Saturdays

63. None of the theatres served by the Centre at present waits on Saturdays.

System on Sundays

64. At 9 a.m. an empty soiled return truck and a sterilization truck containing the standard set of emergency trays and basin packs are taken to the waiting theatre by sterilizer attendants. Before 8 p.m. the soiled return truck is exchanged and the sterilization truck is " topped up " with trays and basin packs from the Processed Stores Area.

(*c*) Method of Tray Use in Operating Room

65. Early on in the development of the tray system the standardized sets of fabrics required for the particular operation were packed without any standardized arrangement on top of the instruments in the tray. The fabrics were packed in this way merely to keep individual instruments in place during handling of the tray (sterilization, etc.) and to obviate the use of an extra pack for the fabrics. As the service developed in the Centre, instruments and utensils were arranged in a more sophisticated fashion from the point of view of the scrub nurse in the operating room; the fabrics were packed on top of the instruments to suit the order in which the utensils and instruments beneath would be used as the operation proceeded. To illustrate this point the opening stages in the use of a Large Basic Tray may be described.

66. The tray is placed on a 4 by 2 ft. trolley in front of the scrub nurse and to the right of the trolley with the handles of the tray pointing away from her. The circulating nurse removes the strips of autoclave tape holding down the covers, and then unfolds the outer blue cover, laying it over the whole trolley. The scrub nurse unfolds the inner green cover in the same way. In one movement she lifts up the complete set of swabs and dressings and places it on the trolley to the left of the tray; together with the circulating nurse she checks the contents of the set of swabs. The removal of the swabs and dressings set exposes the utensils, which she upturns; then she checks the labels of the bottles containing the skin disinfecting solutions before the circulating nurse dispenses them into the gallipots. She lifts up the Mayo table cover and, in so doing, exposes (*a*) the Rampley forceps already loaded with plastic skin-cleaning sponges, (*b*) the 12 by 7 in. paper " disposal " bag together with the four 2 by 1 in. spring clips (see paragraph 69), and (*c*) the two sets of dissecting forceps, in one of which there is a pair of medium tongs. Having draped the Mayo table, she clips the open end of the " disposal " bag on to the right side of the tray and trolley. Using the medium tongs and a kidney dish, she stocks the trolley with non-autoclavable sutures and adds any supplementary instrument etc. packs known to be required for the particular operation. The circulating nurse fills the hand basins and checks the scrub nurse's count of the first bundle of swabs. The scrub nurse is now ready to assist the surgeon.

67. While the patient's skin is being disinfected the scrub nurse lifts up four small drapes (S) thus exposing both Bachaus and tetra towel clips. As the patient is being draped with the small drapes, two extra-large drapes (Ex. L) are lifted exposing the instruments required for the incision. The extra-large drapes are applied to the patient over the small drapes—one above the incisional area and the other below. After the incision has been made, the wound towels (packed folded ready for use) are lifted and handed to the surgeon and then the tetra towel clips already exposed in the tray. When the two remaining small

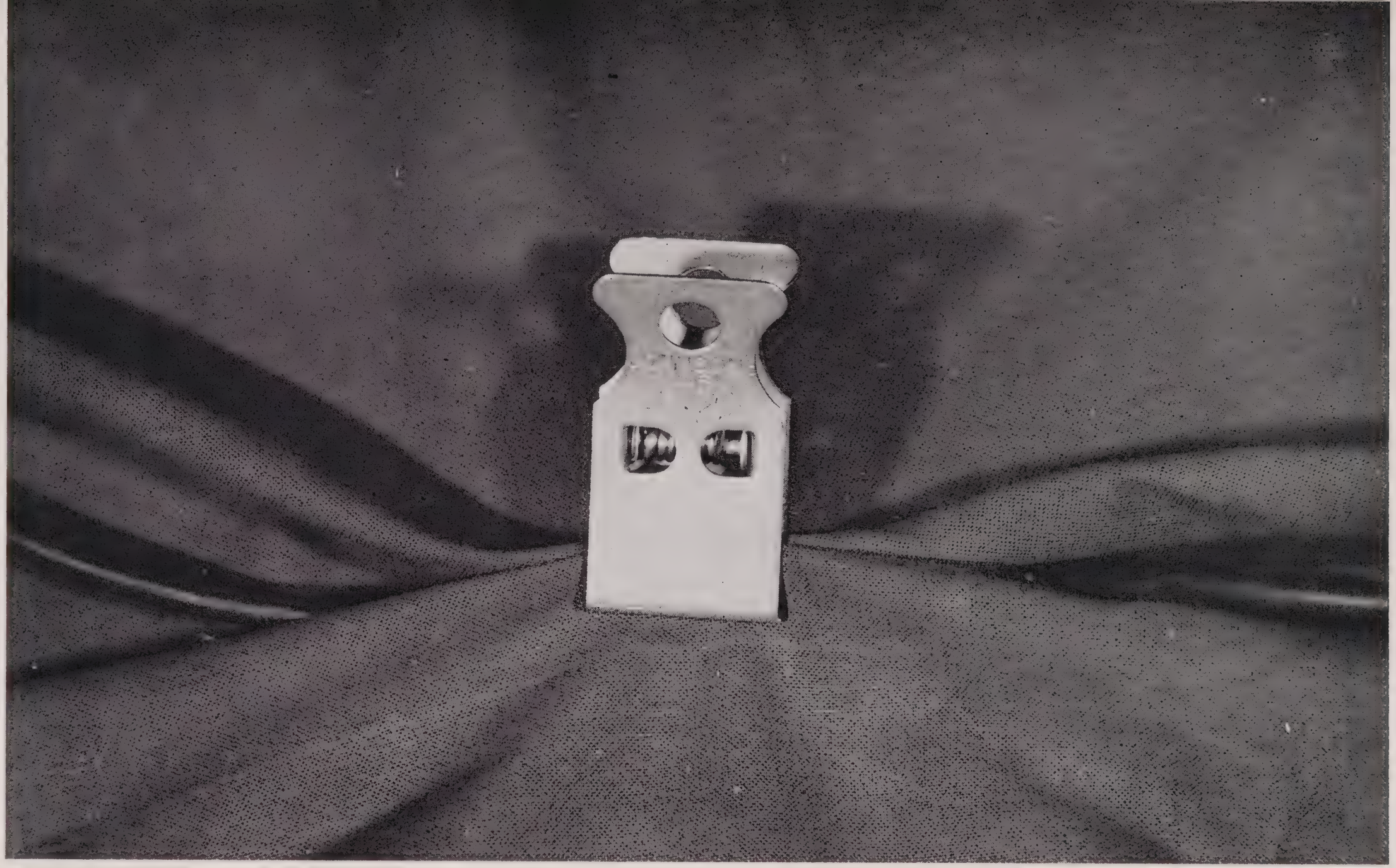


PLATE 13.—Spring Clip.

drapes are placed on the trolley to one side of the tray, the instruments are fully uncovered and ready for use as the operation proceeds.

68. When the half and quarter-size trays are to be used they are placed on a 30 by 18 in. trolley and, in principle, the method of use is as described above for a Large Basic Tray.

69. The spring clips mentioned in paragraph 66 are used by professional photographers for holding strips of film undergoing processing. They are made of a rustless metal alloy, and the springs withstand hundreds of autoclaving runs. They are particularly useful for purposes such as holding diathermy leads (Plate 13), holding suction tubing to drapes (for which towel clips are generally used), or for clipping the disposal bag to the side of the tray. As supplied by the manufacturer—Johnson of Hendon—the jaws are sharp and have to be rounded off by an engineer, who must also widen the distance between the two handles of the clip. They are supplied as " Single-ended Trade Clips " at 1s. 9d. each—a very great deal cheaper than towel clips.

Section IV

THE RESULTS OF THE EXPERIMENT

70. In considering the work that has been done in an experiment such as has been undertaken and in analysing the results of the experiment, it is necessary to look beyond the immediate objective of the remit in relation to the physical planning of a Theatre Service Centre in the new Royal Infirmary. We have, therefore, included in our analysis an account of some of the difficulties that we experienced in relation to the supplies of equipment and materials. We have also studied the effect that the service has had on other departments, mainly by a consideration of reports submitted by other people; we also feel that the overall planning of a new hospital would be incomplete if we did not make some comment on the wider implications of introducing a non-traditional type of service into an established hospital organization.

(*a*) Service to Theatres

71. Records have been maintained of the service to theatres in terms of quantities of trays issued throughout the six-month period.

72. During the six-month experimental period, August 1964 to January 1965, the total numbers of surgical sessions, trays used, and operations performed (*i.e.* those during which trays were used), were as follows:—

Table 2

NUMBER OF TRAYS USED

	Operations	
	Elective	Emergency (in 12-hour periods)
Sessions	182	125
Operations . . .	684	374
Trays used . . .	1,122	413

73. During the experimental period neither the number of sessions nor the number of operations per session showed any significant difference from those of corresponding periods prior to the experiment, since the number of beds dependent on the theatres served by the Theatre Service Centre remained constant. However, there may have been a slightly increasing tendency to perform "cold" operations during the daylight hours of "waiting" (emergency) sessions.

74. There was a significant and progressive increase in the number of operations performed using trays, (*a*) as experience of the tray system of supply was gained, (*b*) as the variety of trays was developed, and (*c*) as the number of theatres served increased from two to three in December. The monthly rate of increase in the use of trays is illustrated in Table 3.

TABLE 3

NUMBER OF OPERATIONS AND TRAYS PER MONTH

Month	Elective		Emergency		Total	
	Operations	Trays Used	Operations	Trays Used	Operations	Trays Used
August . .	33	52	11	13	44	65
September .	85	148	58	37	123	185
October. .	112	189	48	52	160	241
November .	119	195	71	78	190	273
December .	132	235	85	93	217	328
January. .	203	303	121	140	324	443
Total .	684	1,122	374	413	1,058	1,535

TABLE 4

RATIO OF TRAYS PER OPERATION

Month	Elective	Emergency	All Operations
August	1·57	1·18	1·48
September	1·74	1·00	1·50
October	1·70	1·08	1·50
November	1·64	1·10	1·44
December	1·79	1·09	1·51
January	1·49	1·16	1·37
Average, 6 months .	1·65	1·11	1·45

75. Based on the figures given in Table 3, the average number of trays per operation is shown in Table 4.

76. The progressive increase in the use of individual trays on a monthly basis over the six-month period is given in Appendix 6.

77. The tray service for the three theatres became comprehensive towards the end of December 1964. It was decided to make a study of the number and nature of elective and emergency operations during the month of January 1965 in relation to the number of trays used for each type of operation; the detailed analysis of this study is given in Appendix 7, and a summary of the analysis is shown in Table 5. It is interesting to note that 101 supplementary instrument packs and 46 special instrument packs were used during elective sessions, but that only eight supplementary instrument packs and no special instrument packs were used during emergency sessions.

TABLE 5

USE OF TRAYS AND PACKS DURING JANUARY 1965

Type of Tray/Pack	Number of Trays/Packs Used		
	Total January 1965	For Elective Operations	For Emergency Operations
Large Basic Trays	89	67	22
Medium Basic Trays	90	37	53
Small Basic Trays	48	32	16
Supp. Trays (with L.B. Trays)	92	78	14
Supp. Trays (with M.B. Trays)	15	12	3
Supp. Trays (with S.B. Trays)	8	7	1
Supp. Trays (with no basic tray)	101	70	31
Supp. Instrument Packs Gp. 1	40	40	...
Supp. Instrument Packs Gp. 2	69	61	8
Special Instrument Packs	46	46	...
Utensil Packs	262	...	...
Linen Packs	27	...	...
Swab Packs	35	...	...
Bandage Packs	13	...	...
Gown Packs	255	...	...
Special Burn Packs	1	...	...

(*b*) Recruitment and Training of Staff

78. The " Tray Assembler " is a new category of staff employed in the hospital organization. Much of the success of a Theatre Service Centre is dependent on the reliability of the tray assemblers, and the Theatre Service Centre Supervisor accordingly regarded as one of her most important duties in the early stages of the development of the centre the careful selection and training of tray assemblers.

79. They were recruited for service in the centre through the Domestic Staff Office with assistance and advice from the Domestic Superintendent. The tray assemblers were formerly domestic staff employed in the operating theatres, wherein they were graded as Group I. The first three weeks of service in the Theatre Service Centre was regarded as a probationary period, during which time the tray assemblers were able to decide whether or not they wished to continue with this new type of work. At the same time the Supervisor was able to assess the suitability of the tray assemblers for continued employment. A high standard of speed and accuracy was demanded of the tray assemblers, in view of the high standard of efficiency that the operating theatres would demand of the Theatre Service Centre. On satisfactory completion of the probationary period tray assemblers were upgraded to Group IV.

80. Training of the tray assemblers commenced from the first day of appointment. They received instruction in the checking of linen for quality and damage; folding linen in the correct manner; the recognition of instruments from description lists and photographs; and the setting and assembling of trays and packs. They have become extremely efficient in their duties, and the

pride they take in their work is noticeable. There is no doubt that employment as a tray assembler is regarded as a prize worth gaining.

81. On one occasion a tray assembler with no previous theatre experience was engaged. It was found more difficult to train her for the duties expected of her; it would have been possible to train her over a longer period of time, but she had to give up employment because of domestic circumstances. This stresses the need to engage staff from among those who are unlikely to be off duty frequently because of home circumstances; the very small number of tray assemblers employed and the high degree of training that they are required to undergo make it impossible to replace them at short notice.

(*c*) Space Limitation

82. The present layout of the Theatre Service Centre contains a number of undesirable features. The Decontamination and Tray Assembly Area, accommodated in a Nightingale ward, provides one long process line, which determines the disposition of the equipment and storage racks; this layout creates areas of high activity and other areas in which no activity takes place. The one door serving as both an entrance and an exit produces cross-traffic problems at that point and also dictates the shape of the process line as a two-way flow instead of the preferable single-line flow. The distance of the Sterilizing Area and Processed Stores Area from the main processing area is an obvious disadvantage from both service and staff control points of view.

(*d*) Effect on Other Departments

83. The introduction of a new service from a central supplying agency is bound to have an effect on the working of those departments served by it. A true assessment of this effect can only be ascertained by prolonged study; the period of the experiment was in fact too short for such a study. Nevertheless, it was important that the Theatre Service Centre should be made constantly aware throughout the experimental period of the impact it was making on the theatres it was serving and on the work of the staff in those theatres, so that the Centre could remedy any defects in the supply system. There was continual personal contact between members of the working party and theatre staff throughout the period, at the end of which the users of the service were invited to express their views. The following paragraphs give an indication of the views expressed by surgeons and nurses.

(i) Surgical Staff

84. The simplicity of the procedure at the start of the operation and the standardization of the clearing-up process afterwards have greatly reduced the work of nursing staff in theatres. With an experienced team the drill between operations can be done in a time much less than the interval currently thought to be bacteriologically desirable. The value of the system has become especially evident in an emergency, when a vacant theatre can be prepared in less than half the time it took formerly.

85. The question is bound to be raised whether this system will reduce the number or alter the calibre of the nursing staff required in operating theatres.

In that it takes a number of semi-skilled and unskilled tasks away from the vicinity of operating theatres it must reduce the number of nurse-hours required, but it does nothing to alter the minimum requirements during the operation of one scrub nurse fully trained in theatre technique and two circulating nurses. The implications on nurse training also require consideration in that the disposal, preparation, and sterilization of material are now all taken out of the operating theatre. There would appear to be a case for all nurses in training spending at least two weeks in the Theatre Service Centre.

86. It is the experience of surgeons that instruments can be produced and maintained in a first-class state of repair at all times. The experiment has also proved that a proper selection of instruments can be obtained for virtually any case at extremely short notice; and it has reduced considerably both the time required between individual operations in a list and, as a corollary, the amount of work that used to be required of theatre staff.

87. The surgeons whose theatres were served met with no difficulty with regard to the type of equipment supplied, possibly because they were partly responsible for the initial choice of instruments on each tray. They do recognize that other surgeons may have individual preferences for certain instruments, but they feel that this is adequately catered for by the provision of special instrument packs.

88. On the occasions when a theatre made the wrong selection of trays for a specific case it was invariably found possible to obtain the additional equipment at very short notice.

(ii) Nursing Staff

89. The nursing staff intimately concerned with the service met together and have given their concerted views on the advantages and disadvantages of the service as they found it. Their views are given in the following list:—

" 1. **General Policy**

The nursing staff were unanimous in their opinion that an experiment such as this has stimulated thought and discussion and bound all members of the theatre team more closely together in their endeavours to achieve happy co-operation for the good of all. They are grateful for the effort that the Theatre Service Centre staff has made to fulfil all expressed needs and iron out any difficulties.

" 2. **Effect upon Theatre Work**

(*a*) It was agreed that the following good effects were apparent:—

(i) Improved aseptic technique, because of layout and preparation of trays.

(ii) Greater security felt by the " scrub nurse," who learnt confidently to expect the equipment on her tray to be correct and in perfect working order.

(iii) All theatres served by the trays become automatically consistent in their routine, thus standardizing methods.

(iv) The drudgery of cleaning and maintaining instruments has been gladly relinquished.

(v) Safety and speed available if a second theatre has to be unexpectedly opened during the night.

(vi) Less equipment is stored in the theatres, therefore less to care for, and more room available.

Summary of advantages—Efficient, quick, and safe.

(*b*) It was agreed that the following disadvantages were noted :—

(i) The large basic trays were very heavy to lift.

(ii) Some sisters thought the large trays were too wide, being 6 in. wider than standard trolley. Although noted, other sisters found the extra width useful.

(iii) Sisters disliked mixing used instruments with the clean ones on their trays at the end of an operation. Although they accept that this is bacteriologically safe, they would prefer that some sort of container was available to receive the used instruments. They suggest that this container could arrive holding the linen on the trays.

Summary of disadvantages—Size and weight of trays, aesthetic difficulty over used instruments.

" 3. **Effect upon the Training of Student Nurses**

(*a*) *Advantages*

1. Great benefit from the standardization of methods and equipment.
2. Increased time available to allow a student to be a " scrub nurse " because she does not have to spend time cleaning, etc.
3. Increased trained-nurse time available to supervise and teach students.

(*b*) *Disadvantages*

1. Students do not become sufficiently used to handling instruments and equipment. Previously they gained in this when cleaning up after cases.
2. They have difficulty in remembering what is required on trays as they no longer have to set them.
3. It is envisaged that nurses moving to other hospitals without a Theatre Service Centre would be at a disadvantage, being slower in preparation and selection of equipment.

In discussion it was recognized that with a full Theatre Service Centre in action the student nurses would spend a period in the Centre assisting and learning. One week was suggested as the necessary time for this experience.

" 4. **Effect upon the Work of the Theatre Sisters**

The theatre sisters agreed that they felt less worried because their theatres had become more efficient, less tired because they were spared the burden of clearing up, especially after a long operation,

and happier because they could spend more time doing nursing duties instead of ordering equipment and doing routine maintenance of existing stock.

" 5. **General Comments**

The consensus of opinion is that the Theatre Service Centre's advantages outweigh the disadvantages."

90. From the nursing administrative point of view the Lady Superintendent of Nurses has expressed her own personal view on the effect of the Theatre Service Centre on the nursing staff. She stresses the need for the Supervisor to be a trained nurse and that all future theatre sisters should spend some time in the Centre obtaining experience as her assistant. There should be the closest liaison between the Theatre Superintendent, the Nurse Tutors, and the Theatre Service Centre Supervisor.

91. The Lady Superintendent of Nurses feels a certain uneasiness in the practice of not checking instruments out of the theatre between cases.

(*e*) Equipment and Materials

92. One of the first principles to be observed by any supplying agency is that the goods it supplies should be of a quality not less than that of a predetermined standard. In the case of the Theatre Service Centre the Working Party insisted on the strict observance of this principle as a means of gaining and retaining the confidence of the theatres in the service provided by the Centre; it was felt that absolute confidence in the work of the Theatre Service Centre was an essential feature of the experiment. Strict examination of all instruments and linen, whether purchased as new items or obtained from existing stocks in theatres or hospital stores, was undertaken in the Theatre Service Centre prior to their being issued for use in theatres. This careful inspection was much appreciated by the surgeons, one of whom reported that the service had demonstrated how a number of faulty instruments may formerly have been accepted for use in theatre without due recognition of the faults. The handling of large quantities of material by the Theatre Service Centre in a comparatively short space of time was not without its difficulties, some of which are recounted below.

(i) Linen

93. The difficulties experienced with the linen supply were of two kinds, viz. defects in the raw material, and damage to the linen during use.

94. In the initial stages of the experiment, mainly because of the speed in bringing the experiment into operation, orders were placed for ready-made drapes and other linen articles; latterly the cloth was purchased in bulk.

95. A full-time seamstress was appointed when it was found that drapes cut to size and hemmed by two manufacturers frequently had to have weaving faults darned over and the edges re-hemmed. A further advantage of making drapes in the Theatre Service Centre is that tests to determine shrinkage rates can be performed—and the necessary allowance made—before cloth is cut to

size. A second-hand electric household Singer machine (Model 201 K2) was purchased. Compared with an industrial model, the advantages are that the darning attachment does not cause open needle holes or " drawing " of the cloth and the machine is easy to use for labelling; the disadvantage is that the motor is comparatively slow and tends to overheat if worked continuously for long periods.

96. A great deal of trouble was experienced in buying linen at reasonable prices without frequent and often extensive faults in weaving and without excessive shrinkage rates after laundering (up to 12 per cent.); even cotton stated by the manufacturer to be pre-shrunk contracts 2 per cent. or more after laundering—usually lengthwise in the bolt of cloth.

97. The working party came to the view that there appears to be a lack of technical knowledge as to the best kind of cloth for various purposes within the hospital service, and feels that a suitable range of British Standards for patient drape cloths is required.

98. The damage to the linen during use resulted in a considerable amount of time being spent on examination.

99. Each article was scrutinized over the illuminated panel on the table; damaged articles were rejected for any one of the following reasons :—

(*a*) Holes or other flaws in the fabric.
(*b*) Oil stains.
(*c*) Bleach marks.
(*d*) Rust stains.
(*e*) Particles of thread or paper towelling adhering to the material.

100. The most serious reasons for rejection of an item were oil staining, and the presence of threads and paper " fluff." The former inhibited complete sterilization; the latter could present a hazard during an operation.

101. It was necessary to give instructions that terry towelling should be washed separately from the drapes, covers, etc., and that theatres should not put paper towels into the same receptacles as soiled linen.

102. It was more difficult to find a solution to the problem of oil staining, and several tests were conducted to trace the source of it. These tests were inconclusive in that no factor was proved to be responsible. None of the many test pieces in the laundry showed staining after repeated laundry processing. Most of the tests indicated that the source was in the theatres and could perhaps be attributed to an oily substance used during operations, although theatre staff were unable to attribute the staining to any particular procedure in theatre.

103. During one week in November the amount of green linen (drapes, leggings, covers) rejected because of oil stains reached 46 per cent. of the total used. Special arrangements had to be made for dry cleaning the stained articles, because no laundry process could remove the oil.

104. In subsequent weeks the amount of rejected linen fell steadily until at the end of the experimental period it was 3 per cent. of the total used.

(ii) Instruments

105. Considerable difficulty was initially experienced by the Theatre Service Centre in obtaining adequate supplies of good quality instruments. There is no doubt that the demands for instruments placed by the Theatre Service Centre on the suppliers for delivery in a very short time placed a considerable strain on the manufacturers. In order to start the experiment, delivery was required within six months, but the delivery time for some firms is more than a year. It was necessary to place orders with several firms for the same type of instrument; this led to further difficulties such as unmatching sets of artery forceps, tetra towel clips of entirely different design, etc. Often a particular surgical instrument made by one manufacturer was found to be very different from an instrument bearing the same name made by another manufacturer.

106. Most instruments made by reputable firms have the maker's name inscribed upon the product, but we also found that many of the instruments originated from nameless makers, and among these a very high proportion was found to be faulty on receipt. For instance, 140 were inadequately buffed, had cracks in the shafts, joints, or finger rings, or had jaw serrations of irregular pattern. More than 300 jointed instruments had to have stuck joints freed before they could be used. Four people were occupied continuously for ten days in cleaning buffing paste out of jointed instruments and searching for defects in manufacture. Apart from the large numbers of instruments found to be faulty, which had to be repaired before being put into service, 40 instruments had to be returned to the makers for replacement on account of grave faults becoming apparent soon after they had been put into service; for instance, one jaw of a double action bone-cutting forceps broke off during use. The extensive defect in the metal at the point of fracture was quite evident on the broken surface.

107. In an experiment such as this it is not possible to change over from one system of supply to a completely different system, involving as it does a more meticulous degree of inspection, and still keep the theatres in use without any break, unless completely new sets of instruments are provided to equip the trays required for the initial theatre to be served. This naturally created a reserve stock of instruments in the theatres. It was the policy of the Theatre Service Centre to withdraw that stock as each theatre went over to the full tray service.

108. Unfortunately, the rate at which the withdrawal of stock could be done was considerably slower than was at first anticipated. The vast quantity of instruments involved and the extremely high proportion of instruments requiring repair before acceptance by the Theatre Service Centre for use in trays created a problem that the instrument repair section of the Centre could not cope with. Most of the instruments returned from the theatres were functionally satisfactory, but practically every instrument had to be buffed and cleaned in the ultrasonic unit for long periods before it could be brought into service. It may therefore be necessary to employ the services of an outside firm if this stock of instruments is to be made available for an extension of the service to other theatres.

109. It was noted that the system evolved in the Theatre Service Centre of keeping instruments clean is such that, provided clean instruments are used

from the outset, they remain clean even after eight months continuous use, and there appears to be nothing to suggest that this period could not be extended indefinitely. Instruments received inadequately buffed had to be rebuffed in the Centre before being brought into service. Once brought into service, no instrument has had to be rebuffed.

110. The experience gained in the Centre emphasizes the need for some system of constant and careful inspection of all equipment and materials supplied to theatres.

(*f*) Financial Effect

111. The financial implications of the experiment are detailed under two groups, viz. cost of equipping and maintaining the Theatre Service Centre and the cost of servicing theatres.

112. The cost of equipping and maintaining the Theatre Service Centre amounted to :

(i) **Capital Costs—**

Ultrasonic Cleaner (including Drying Unit)	£3,288
Hobart Washing Machine	1,141
Drayton Castle Sterilizer (including modification for trays)	2,379
Trolleys	296
Miscellaneous Equipment	1,205
Alterations to Buildings	3,121
Benching, Furniture, etc.	689
Telephone Installation	241
Miscellaneous	375
Total,	£12,735

(chargeable to Capital allocation)

(ii) **Running Costs—**

Staff	*Preparatory Period* (*up to* 31.7.64)	*Experimental Period* (1.8.64 *to* 31.1.65)	*Total*
Nursing Staff	£523	£450	£973
Charge Hand (additional payment)	45	54	99
Tray Assemblers	259	960	1,219
Seamstress	111	222	333
Cleaners	83	86	169
Total,	£1,021	£1,772	£2,793

Supplies and Service (estimated expenditure)

Laundry	£52
Electricity	50
Steam	9
Printing and Stationery	10
Miscellaneous	50
Total,	£171
Total Running Costs,	£2,964

113. The cost of equipment and materials purchased for servicing the theatres amounted to :

(i) **Capital Costs**—

Trays	£492
Instruments and Utensils	7,428
Linen	1,570
Total,	£9,490
(chargeable to Capital allocation)	

(ii) **Running Costs**—

Dressings, Bandages, etc.	£1,540

The expenditure on dressings is higher than one would normally have expected by about 20 per cent. due to the increased costs involved in experimentation of packaging by manufacturers at the request of the Theatre Service Centre.

114. The total cost of the experiment therefore amounted to :

Capital—£22,225 (Capital allocation—£23,250).

Running Costs—£4,504.

115. The value of equipment and materials in circulation at the end of the experimental period required to service three general theatres was :

16 Trays (full size) at £2. 19s. 6d. each	£47	12	0
32 Trays (half size) at £2. 9s. 3d. each	78	16	0
25 Trays (quarter size) at £1. 14s. 6d. each	43	2	6
Instruments and Utensils (*vide* Appendix 8)	6,382	16	11
Linen (*vide* Appendix 9)	1,790	6	6
Total,	£8,342	13	11

Section V

RECOMMENDATIONS

116. From a study of the working of the experiment, an analysis of the results achieved, and a consideration of the reports of those who have used the service, we have reached certain conclusions concerning the organization of a Theatre Service Centre, which we submit as short-term and long-term recommendations. We also submit subsidiary recommendations on questions of the specification of equipment and the training of staff, which were brought to light during the course of our investigations.

(*a*) Short-term Recommendations

117. We are satisfied that the experiment has been extremely valuable, but much more study requires to be done with regard to the practical details of the organization of a Theatre Service Centre. For example, studies in the composition of trays and packs, in the standardization of equipment for theatres and Theatre Service Centrė, in the activities of the staff in the Centre, in the training of nurses in the processing of equipment through the Centre, in the handling of trays in the theatres, in the methods of checking instruments post-operatively, in the disposal of waste material, and in the inspection and repair of equipment, are only a few of the many that require to be undertaken. It has been our experience that as additional theatres come into service new problems arise; these problems can only be solved in a practical manner. If our long-term recommendation given below is accepted, we strongly advise that the service be continued as a permanent measure by the Board of Management for the Royal Infirmary and that it be extended to serve all theatres in the existing hospital, so that by the time the operating theatre suite of the new Royal Infirmary comes into use, the method of supply will be an accepted practice and the staff adequately trained. We are not in a position to specify any time schedule by which the Board of Management should extend the service, but we would advise the Board of Management that there should be a minimum of delay.

118. We feel that the cost of implementing the service to the full can be adequately calculated from the financial details we give in paragraphs 111 to 115. We have not taken into account the value of instruments already held in theatre stocks; we would suggest that, in extending the service, the Board of Management withdraws all instruments from theatres fully serviced by the Theatre Service Centre and offsets the value of these against the cost of extending the service to additional theatres. In this respect, however, we would point out that the amount of work involved in the repair of these instruments may be quite considerable and may call for repair by an outside instrument manufacturer.

119. We would further recommend that Ward 4 be retained as the Decontamination and Tray Assembly Area of the Theatre Service Centre. It is already designed and equipped as such; any change in location might result in a serious breakdown in the service to theatres.

120. If our short-term recommendation is accepted as a means of obtaining detailed information on the practical aspects of the organization of a large-scale Theatre Service Centre, we would recommend that all the capital equipment purchased for the experiment be given to the Board of Management to enable it to continue and extend the service.

(*b*) Long-Term Recommendations

121. We are of the opinion that a system of supply of sterile goods from a central source or sources to an operating theatre complex is the most satisfactory method in modern conditions. Extreme care is now exercised in the control of staff movement within a theatre and in the prevention of accidental contamination of an operating theatre area by staff; the transfer of patients from " dirty " to " clean " areas and the garbing of patients in sterile clothes are also strictly controlled; but the contamination of an operating theatre area by inadequately sterilized material things under the present system of supply is always a strong possibility. A system by which each theatre undertakes the sterilization of its own instruments can only be satisfactory provided that adequate time is allowed between operations for the cleaning, sterilization, and assembling of instruments, or, alternatively, that each theatre carries sufficient stocks of instruments to deal with not less than two operations. In actual practice it is customary for theatres to carry a larger stock than might be regarded as strictly necessary. Nevertheless, it has been our experience that, no matter how large a stock a theatre carries, most of the instruments returned from theatre stock have been inadequately maintained. We are also satisfied that very few theatres have either the time to spend upon, or the necessary equipment to deal with, the amount of washing, cleaning, and sterilizing that is required in order that a satisfactory set of instruments may be presented to a surgeon. We are therefore strongly of the opinion that, if the highest possible standard of sterile theatre instruments and linen is to be maintained throughout all theatres in the new Royal Infirmary, supply from and adequate inspection and maintenance by a central source is essential. In our view, this is the most important argument in favour of establishing a central Theatre Service Centre, and our following recommendations regarding design, layout, and functions of the Centre are based principally on this argument; convenience in theatre working and the relatively lower cost are to our mind secondary considerations.

122. It is important that we should state clearly what in our opinion the true function of a Theatre Service Centre is, so that our recommendation may be read in its proper context. There has been much confused thinking with regard to the definition of a Theatre Service Centre as distinct from that of a Theatre Sterile Supply Unit. A Theatre Service Centre, as we visualize it, is an area associated with a group of theatres or a theatre complex, in which instruments and linen are processed and assembled in such a way that they are presented in the correct order and in the correct quantity for a particular procedure being undertaken by a surgeon; a Theatre Service Centre, therefore, merely serves to centralize work that was formerly undertaken by the theatres themselves.

123. The packages issued to the theatres during the experiment fall into two categories: the first category comprises those more closely related to particular operative procedures, *i.e.* trays, supplementary and special instrument packs, and supplementary utensil packs; the second category comprises those of a more general nature for use in a theatre, *i.e.* supplementary linen packs,

supplementary dressing packs, and gown packs. The processing of the trays and packs included in the first category is undertaken immediately on return of the used trays or packs from the theatre, otherwise it would be necessary to build up larger stocks of expensive instruments; the processing work is therefore geared to the tempo of theatre work. The processing of packages in the second category is undertaken when time permits and consists of building up sufficient packages against possible demands; the processing is not therefore geared to the tempo of a theatre, but can be regarded rather as a commercial process. This may be regarded as a fine distinction, but we feel it is of sufficient importance to warrant a separation of the two processes. The preparation, processing, and supply of supplementary linen, dressings, and gown packs would in our opinion best be undertaken by a central Sterile Supply Department and issued to theatres via the Processed Stores Area of the Theatre Service Centre. The processing of trays and packs associated with particular operations would form the true work of the Theatre Service Centre, which could therefore concentrate fully on this more urgent aspect of service to theatres. Our experiment has convinced us that there is no justification in part of the normal work of a supplying department such as a Central Sterile Supply Department being taken over by a Theatre Service Centre, merely because the Theatre Service Centre may require some of the materials normally processed by a Central Sterile Supply Department. Only sufficient stocks of those materials—linen drapes, tray covers, wrappers, dressings, and bandages—that are required for inclusion in Theatre Service Centre trays or packs need be held by the Theatre Service Centre. Our recommendation given below therefore refers solely to a Theatre Service Centre in which the work of inspecting, maintaining, washing, cleaning, sterilizing, and assembling instruments is centralized in one area instead of being scattered throughout all theatres. We see the Theatre Service Centre as one of several supplying agencies to a theatre complex, but we visualize the sterile and sanitized products of those agencies—Theatre Service Centre, Central Sterile Supply Department, Pharmacy—meeting at one point, viz. the Processed Stores Area of the theatre complex; our recommendation demonstrates the relation of the Theatre Service Centre to this common store. As a corollary to our views, we would advocate, in order to avoid confusion, the abolition of the term " Theatre Sterile Supply Unit."

124. With regard to the function of the Theatre Service Centre we submit the following recommendations:

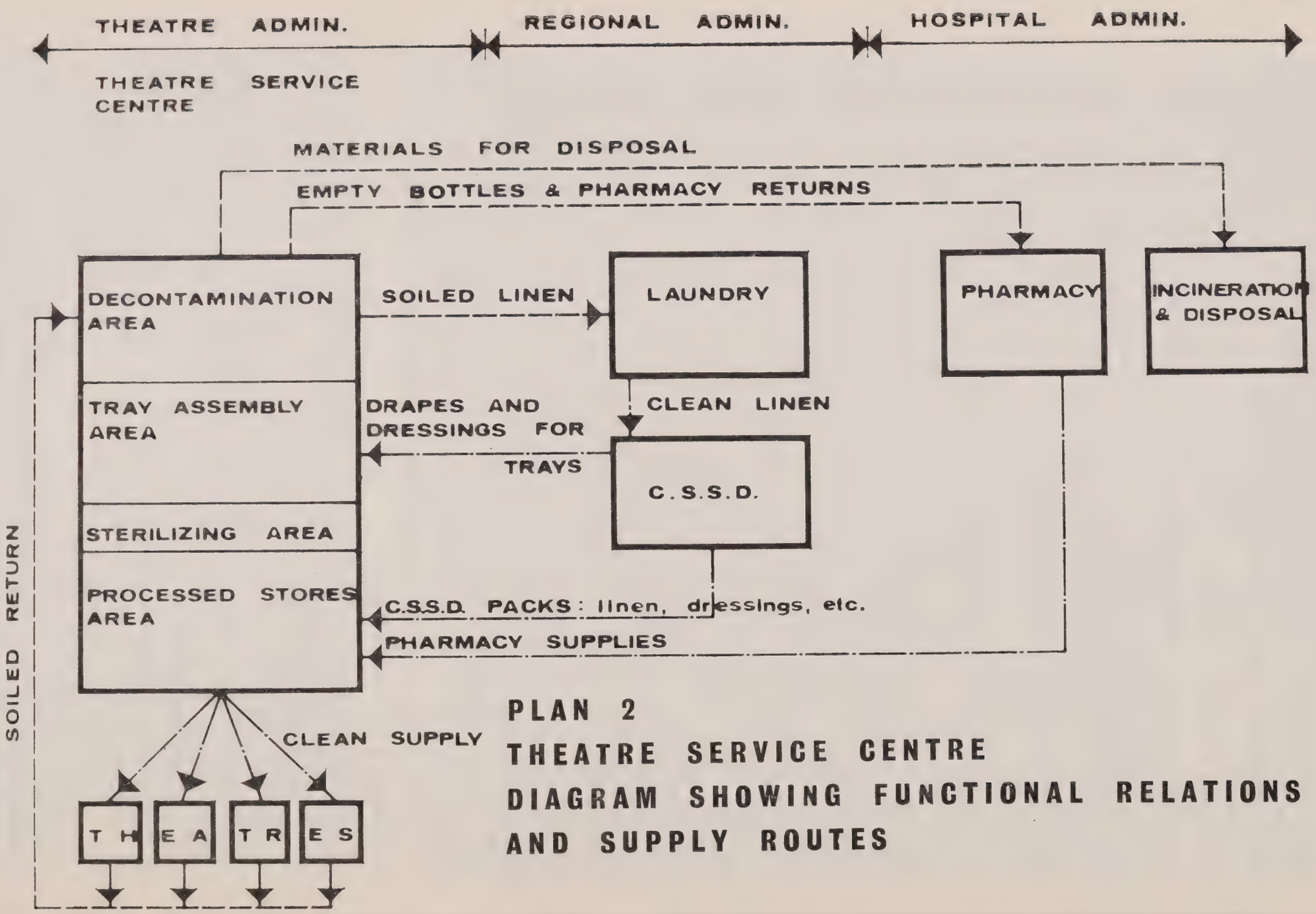
(i) That the Theatre Service Centre should consist of four main functional areas: Decontamination Area, Tray Assembly Area, Sterilizing Area, and Processed Stores Area.

(ii) That the work of the Theatre Service Centre should be restricted to processing composite trays and packs for specified operative procedures.

(iii) That the method of processing should be as described in detail in Section III of our report.

(iv) That the Processed Stores Area should form part of the Theatre Service Centre, but that it should receive sterilized and sanitized supplies from outside sources, viz. C.S.S.D. and Pharmacy, for distribution to the operating theatres.

125. In Plan II we show diagrammatically the functional relations of a Theatre Service Centre to other associated areas and the method of distribution of supplies to and from operating theatres.



PLAN 2
THEATRE SERVICE CENTRE
DIAGRAM SHOWING FUNCTIONAL RELATIONS AND SUPPLY ROUTES

126. We consider it important that the Theatre Service Centre should be under the control of the theatre administration, the work of the Theatre Service Centre being directly related to that of the theatres. We assume that there would be a Theatre Superintendent in charge of the whole theatre complex, and we accordingly recommend that the Theatre Service Centre Supervisor should be a sister of considerable theatre experience immediately responsible to the Theatre Superintendent for the efficient working of the Theatre Service Centre.

127. We could not at this stage give any estimate of the cost of providing a Theatre Service Centre in the new Royal Infirmary, but we would point out that we should expect to see a considerable reduction in the capital cost of equipment required for such a service compared with the cost of providing equipment under the present system. We consider that three process lines with five sterilizers would fully serve the needs of the theatres in the new hospital; under the present system of individual theatre sterilization each theatre would require a separate process line with sterilizer, resulting in considerable under-employment of capital equipment.

128. The space required, with consequent reduction in building costs, in providing a Theatre Service Centre is considerably less than the space that would be required to be provided in each theatre for its own processing system.

129. We have shown in paragraph 115 that the cost of non-disposable materials in circulation for service to three general theatres amounts to £8,342. Full use is made of all instruments; there are no idle stocks. It is difficult to calculate the value of instruments and materials in theatres under the present system of individual theatre sterilization, but an estimate of the average value is probably in the region of £5,000. On a 14-theatre complex the saving on the cost of theatre instruments would, by this estimation, amount to approximately £30,000. This figure is merely intended to convey an impression of the extent of savings that one would look for by the method of service described; a much more detailed financial analysis would be required to determine more accurately the financial saving.

130. The staff associated with a Theatre Service Centre for the new Royal Infirmary would, in accordance with our observation during the experiment, be of the following order:—

1 Theatre Service Centre Supervisor.
1 Deputy Supervisor.
18 Tray Assemblers.
1 Charge Hand Sterilizer Attendant.
3 Sterilizer Attendants.
1 Seamstress.

This staff establishment was calculated on the basis of the work done during the experiment, which includes work on the packaging of linen, bandages, and dressings, which we now suggest would more properly be done by the Central Sterile Supply Department. An appropriate allowance for this would amount to 20 per cent. of the time of the tray assemblers. If our recommendation is accepted the estimate of staff given above would be reduced by three tray assemblers.

(*c*) Subsidiary Recommendations

131. In the course of our experiment we have noted two points that are probably worthy of consideration. We feel that they are of sufficient importance, in the light of modern developments in operating theatre design and techniques, to be mentioned in this report; we now submit suggestions in respect of these points.

(i) Equipment

132. We have been surprised by the variety of instruments that may be supplied by different manufacturers against orders for what was intended to be the same instrument. That is not entirely the fault of the manufacturers; the ordering system in hospitals is far from ideal. Many orders are placed for instruments illustrated in manufacturers' catalogues, in which there may be an inadequate description. We appreciate that the British Standards Institute is endeavouring among other projects to standardize the description of instruments in use in hospitals; the effect of that is not yet apparent in hospitals. Likewise there appears to be a variety in the quality of manufacture; this would be overcome by complete specification by the British Standards Institute. It is not, however, sufficient for standards to be specified by the British Standards Institute unless those specifications are made known to the users in the hospital field. We strongly advise that a catalogue of instruments, adequately specified in accordance with B.S.I. standards, be prepared and issued to hospitals for reference and ordering purposes; we would therefore suggest that a catalogue, similar to the Priced Vocabulary of Medical Stores used by the Army Medical Services for many years, be prepared and adopted as a guide to hospital authorities. The task of preparing such a vocabulary is of course not that of the British Standards Institute, but each item in the vocabulary should be adequately cross-referenced to the appropriate British Standards Institute specification. We appreciate the vastness of this task, but we suggest that there is an urgent need for the vocabulary; for the lack of it was only too apparent when we attempted to purchase large quantities of instruments at short notice.

133. The difficulties we experienced in respect of instruments we also experienced in respect of linen. Again we would suggest a similar system of specification and cataloguing. Apart from difficulties with regard to the supply of good-quality cloth, we also experienced internal difficulties within the hospital with regard to the considerable variety of sizes of linen drapes used in different theatres for presumably the same purpose. We standardized on a limited number of sizes, which we suggest should be adopted throughout the hospital.

134. There is of course a possibility of individual ideas being forced upon an accepted system as more and more theatres are brought into service. That possibility will make itself evident in the desire of individual surgeons to express their own ideas with regard to the equipment required for an operation; they may thereby request major alterations in the composition of trays. There is a grave danger, if such expression of ideas were permitted to overrule accepted policy, of the system breaking down because of individual preferences. We suggest therefore that any individual preferences could best be met by the system of special instrument packs that we have permitted, but that any alteration in the composition of trays and supplementary instrument packs could only be done on the authority of a representative committee of surgeons and theatre sisters.

(ii) Training

135. It has been apparent to us from our own observation and from reports we have received from others that some little difficulty is experienced by nurses having to practise two different systems of operating theatre technique. There is no doubt that the nurses prefer the Theatre Service Centre system in that it relieves them of a form of work that in the modern form of nurse training can no longer be regarded as a nursing duty. Our experiment has demonstrated clearly that the work of processing instruments can be better achieved by domestic staff trained for and employed on this work than by nursing staff in operating theatres, who have other duties to perform. Nevertheless, this does not absolve the training authorities from organizing instruction of nurses in the processing and assembling of instruments in the Theatre Service Centre either as a regular part of their training or before their posting to theatre duties, and we would recommend accordingly. We would also support the view of the Lady Superintendent of Nurses that each theatre sister should serve for a period in the Theatre Service Centre as deputy to the Supervisor before taking up duty in a theatre. The posting of nurses trained in the work of the Theatre Service Centre to appropriate theatres is a responsibility of the nursing administrative authorities, on which we would not presume to advise other than to stress the need to have an adequate pool of nurses trained in Theatre Service Centre methods prior to the opening of additional theatres. Training in this technique should not, however, be restricted to the training of nurses; we feel that medical students would also benefit by familiarizing themselves with the composition of trays and the techniques involved in their processing.

(*d*) Conclusion

136. We consider that the experiment we have conducted has demonstrated the practicability of providing a Theatre Service Centre in the new Royal Infirmary of Edinburgh. Much detailed work, however, still remains to be done. In particular we should like to mention the need for further experimental work in automatic loading and unloading of sterilizers; the development of washing, cleaning, and drying equipment; the composition of trays and the order of assembly of instruments on trays; the development of trays for additional procedures, including anaesthetic procedures; inspection and standardization of equipment; the use of new materials in the manufacture of equipment. These are only a few of the problems that are constantly arising in theatre development; we suggest that a Theatre Service Centre is the most suitable area in a hospital for the conduct of this developmental work.

137. We are grateful to the Scottish Home and Health Department, the South-Eastern Regional Hospital Board, and the Board of Management for the Royal Infirmary and Associated Hospitals for giving us the opportunity and the financial assistance to conduct this most interesting experiment.

APPENDICES

APPENDIX 1

COMPOSITION OF THE WORKING PARTY

Lt.-Col. J. H. Bowie (Leader of Working Party).
Col. W. Mackie (Chairman, Theatre Service Centre Committee).
Sister I. Brown (Theatre Sister).
Sister M. H. F. Kennedy (Theatre Sister).
Sister E. Lindsay (Theatre Sister).
Sister A. McCreath (Theatre Sister).
Sister S. B. R. Scott (Theatre Service Centre Supervisor).
Mr A. I. S. Macpherson (Surgeon).
Sir James Fraser (Surgeon).
Mr G. P. R. Murray (Architect).
Mr J. A. Myers (Group Chief Pharmacist).
Mr A. A. Inglis (Photographer).
Mr B. G. Summers (Group Superintendent Engineer).
Mr G. Notman (Building Supervisor).
Mr J. Dick (Chief Laboratory Technician).
Miss E. D. Cuthbert (Work Study Officer).
Mr F. Daly (Work Study Officer).

APPENDIX 2

LIST OF THOSE WHO HAVE SUBMITTED WRITTEN COMMENTS

Col. W. Mackie.
Lt.-Col. J. H. Bowie.
Mr A. I. S. Macpherson.
Sir James Fraser.
Mr J. A. Myers.
Mr D. F. Hardman.
Miss M. H. Cordiner.
Sister S. B. R. Scott.
Mr G. P. R. Murray.
Dr S. G. M. Francis.
Work Study Department, S.E. Regional Hospital Board.

APPENDIX 3

THEATRE SERVICE CENTRE EQUIPMENT

1. PRE-SET TROLLEY TOP TRAYS (Plate 6)

The trays are of three sizes to conform with the width, 26 in. (66 cm.), and depth, 26 in. (66 cm.), of British Standard high pre-vacuum rectangular dressings sterilizers. The dimensions are: full size, 2 by 2 ft. (61 by 61 cm.), half size, 2 by 1 ft. (61 by 30·5 cm.), and quarter size, 1 by 1 ft. (30·5 by 30·5 cm.). In order to provide adequate residual heat to vaporize condensate trapped during the steaming period within trays loaded with metal instruments, the two larger trays are constructed from 12 S.W.G. aluminium sheeting (99·5 per cent. aluminium and 0·5 per cent. manganese) and weigh 4 kg. and 2 kg. respectively. For the quarter size tray, 14 S.W.G. aluminium is used and the tray weighs less than 1 kg. All joints are aluminium welded.

The inner aspect of all four sides of each tray measures $1\frac{5}{8}$ in. (4 cm.) in height, and the upper edge is turned outwards to form a $\frac{1}{2}$ in. (1·3 cm.) flange lip. On the outer aspect of each side and at a distance of $\frac{5}{8}$ in. (1·6 cm.) below the flange, a second $\frac{1}{2}$ in. (1·3 cm.) wide flange is welded into position in order to provide a $\frac{5}{8}$ in. (1·6 cm.) wide gutter round the upper outer aspect of the tray. Two simple turn-down handles protrude from the lower flange on one end of the tray so that the overall dimensions of the tray are as follows:—

	Length	Breadth
Full size	25 in. (63·5 cm.)	$24\frac{1}{2}$ in. (62·2 cm.)
Half size	25 in. (63·5 cm.)	12 in. (30·5 cm.)
Quarter size . . .	$12\frac{1}{2}$ in. (31·7 cm.)	12 in. (30·5 cm.)

The handles are needed to facilitate the unloading of the trays while still hot from the sterilizer. They also act as the guide in positioning the covered sterile tray upon the instrument trolley in the operating room—the handles should point away from the scrub nurse. The gutter round the upper outer aspect of the tray is required for the retaining spring cord holding the covers in position relative to the tray and trolley.

The name of the tray (*e.g.* " Large Basic," " Chest Aspiration " etc.) is stamped by means of a " Dymo Tapewriter " on to an adhesive contrast aluminium metal strip, which is then stuck on to the side of the tray below the handles.

2. SOILED RETURN TRUCK (Plate 4)

After each elective operation the truck is used for the collection and transport from the theatre to the Theatre Service Centre of all used trays, hand basins, swabs, and salvaged drapes and dressings.

The truck has a welded 1 in. (2·54 cm.) box aluminium frame, on 9 in. (23·8 cm.) diameter sprung wheels, supporting removable aluminium sheets and doors forming a closed mobile cupboard with an open frame at one end. The top, bottom, sides, ends, and shelves are easily removable for cleaning. Internally, the cupboard is divided into two sections, each of which has a door. The larger section, 26 by 26 by 26 in. (66 by 66 by 66 cm.), for used trays has four equidistant shelves each measuring 26 by 26 in. (66 by 66 cm.). The smaller section is divided into two compartments, each measuring 15 in. (38 cm.) in breadth, 26 in. (66 cm.) in depth, and 13 in. (33 cm.) in height. The upper compartment is used for the transport of salvaged soft goods, and the lower for hand basins and the polythene bag of soiled swabs collected during the operation. The open frame at one end of the truck is designed to carry stapled laundry bags, which can be lifted from the side into the frame space measuring 12 by 26 in. (30·5 by 66 cm.) and open at the top. The upper tubular rim of the frame acts as the pushing and guiding handlebar for the truck.

3. TRAY OFF-LOADING BENCH

Constructed in stainless steel, length 72 in. (183 cm.), breadth 24 in. (61 cm.), and height 34 in. (86·5 cm.), with shelf below.

4. TRANSIT-IN BENCH

Constructed in stainless steel, length 49½ in. (126 cm.), breadth 24 in. (61 cm.), and height 34 in. (86·5 cm.) sloping down ¼ in. (0·64 cm.) per foot (30·5 cm.) to overlap into the inlet of the washing machine. The box edges of the bench top are raised to prevent splashed water from the washing machine dripping on to the floor of the room.

5. HOBART WASHING MACHINE (Model XM 4E/RS)

From previous experience the Working Party were aware that there is, at present, no single method of cleaning surgical instruments that can result in the continued 100 per cent. cleanliness desirable. They therefore decided to use a mechanical washing machine followed by an ultrasonic washing machine. The result has been that the instruments are as clean after six months' use as they were after the first cleaning when new.

The Hobart washing machine is constructed in stainless steel, with supporting structure in steel and internal parts stainless steel, nickel iron, or corrosion-resisting alloys. The overall length, including splash guards on both sides of inlet and exit, is 90 in. (229 cm.), the height 61¾ in. (157 cm.), and the width 32 in. (81·5 cm.).

The loads to be washed are carried through the machine in eight special stainless steel wire frames measuring 20 by 20 by 5 in. (50·8 by 50·8 by 12·7 cm.) external, supplied by the manufacturer of the machine. The frames travel all the way through the machine on two guiding rails supported from the top of the interior by four thin flexible steel bands. The instruments and utensils to be washed are loaded into stainless steel baskets placed within the washing machine frames, jointed instruments being opened widely before being placed in the baskets. The baskets are manufactured by Amsco Europ for use with the ultrasonic washer so that they fit the ultrasonic tank, the final rinse tank, and the drying cabinet—all manufactured by the same firm. As supplied, the baskets' dimensions are 11 by 19 by 11 in. (28 by 48·3 by 28 cm.) high, but the height has been reduced to 5½ in. (14 cm.) for reasons detailed below under " Drying Cabinet." There are 18 such baskets in use.

The mechanical element of the washing action is provided by numerous high-pressure water jets (functioning both from above and below) together with a rapid backwards and forwards jerking movement of the load. The oscillation of the load is effected by means of a set of reducing gears and a cam shaft driven by the 2 h.p. motor operating the hot-rinse pump; this assembly jerks the two guiding rails, which support the frames, backwards and forwards rapidly over a distance of 3 in. (7·6 cm.).

In the length of the machine interior there are three compartments formed by four flexible curtains. A cold-water jet rinse is given to the load in the first compartment. Below the first compartment there is a tank with a water-supply pipe, volume-control valve, and an overflow pipe to drain. From the tank, a ¼ h.p. motor-driven pump supplies the high-pressure cold-water jets acting from above and below the frames. In the second compartment the load is subjected to a high-pressure hot detergent jet wash. The 25-gallon (113·5 litres) hot tank, extending below both the second and third compartments, is steam heated and thermostatically controlled at 160° F. (71° C.). The hot water from the final rinse in the third compartment forms the water supply to the 25-gallon (113·5 litres) hot tank. The tank has an overflow pipe to drain. A 60-gallon (273 litres) calorifier, located in the basement below the room, supplies clean water at 190° F. (87·7° C.) for the hot-water rinse in the third compartment.

In the standard model XM 4E/RS as supplied by the manufacturer, the frames are moved automatically at a predetermined speed through all three compartments by means of actuating arms functioning on transverse bars incorporated in the floor of the frames. These actuating arms have been removed from the second compartment, since the time required for the cold and hot washes varies according to (*a*) whether the instruments have actually been used or not and (*b*) whether they have been used a short or a long time before being subjected to the cleaning process. For instance, instruments used for an emergency operation at 11 p.m. and not cleaned till 7 a.m. next morning usually require longer exposure times in the cold and hot wash compartments than instruments from an operation completed at 10 a.m. and put into the washing machine 15 minutes later.

The actuating arms for onward movement at the entrance to the first compartment and those at the exit from the third compartment have been left *in situ*, so that frames

pushed by hand into the entrance of the washing machine are automatically drawn into the first compartment; likewise if frames occupy the first two compartments, the introduction of a third frame at the entrance to the first compartment slides the first frame on to the automatic ejector arms, which take it through the third compartment in ten seconds and discharge it on to the transit-out bench.

During six months' use the only fault developed by the machine was an easily corrected leak from the hot detergent tank.

The detergent added to the 25-gallon (113·5 litres) hot-jet wash tank is " Ampolite " (Diversey (U.K.) Ltd., 42-46 Weymouth Street, London, W.1.); the amount required has proved to be 600 grams. The tank is drained and refilled after twelve baskets have passed through the machine. The amount of detergent required might be reduced if the final hot rinse did not flow into the tank. On the other hand, if this change in design were put into practice, the number of times the tank contents would have to be changed would increase.

6. TRANSIT-OUT BENCH

The construction and drainage arrangements for the bench loading from the Hobart washing machine are the same as for the transit-in bench, but the length is 73½ in. (187 cm.) instead of 49½ in. (126 cm.).

7. ULTRASONIC CLEANING CABINET (Model AH 500)

The manufacturer is Amsco Europ of Bruges, Belgium. The model was selected on account of the size of the tank, which was the largest available at the time—12 in. (30·5 cm.) broad, 20 in. (50·8 cm.) long, and 12 in. (30·5 cm.) deep. This is a convenient size for baskets of instruments from major surgical operations. The adjacent hot-water rinse tank has the same dimensions and both tanks are housed in a stainless steel cabinet 48 in. (124 cm.) long, 33 in. (84 cm.) from back to front, and 25 in. (63·5 cm.) high. The control panel slopes conveniently upwards and backwards from the back of the counter top in which the tanks are sunk.

The apparatus is designed to operate from 220 volt A.C. 50/60 cycle single-phase electric supply. The electronic generator operates at 25 K.c. and has a power output of 500 watts with peaks of 1,000 watts.

Tuning of the vibrations communicated to the cleaning tank is necessary for different basket loads, and is easily effected by means of a series of control knobs and a meter on the control panel.

For the convenience of the operator a timer with setting dial is inserted into the electric circuit operating the generators, which in turn supply the transducers fitted to the bottom of the cleaning tank. The timer is normally set for five minutes.

The tanks have clamped-on heaters and are thermostatically controlled to 130° F. (54·5° C.) in the cleaning tank and 200° F. (93·3° C.) in the rinse tank. The rinse tank is designed to provide a continuous change of water automatically.

During six months' use one of the two rectifier valves of the generator burnt out and required replacement, and several of the flood switches for both tanks went out of order on several occasions. To facilitate maintenance, the ultrasonic cabinet and the drying cabinet are installed at a distance of 16 in. (40·6 cm.) from the wall of the room at the back of the cabinets.

A water-spray rose on a flexible hose and a similar attachment for compressed air are supplied by the manufacturer with the cleaner, but in practice have been found unnecessary.

By push-button control the ultrasonic tank is emptied at night and refilled next morning. The volume of water thus supplied automatically is 7½ gallons (34 litres). The tank is emptied and refilled once during the day's work. On refilling the tank, 50 grams each of citric acid and Nonol (Kirk Soap Makers Ltd., 1 Woodside Street, Coatbridge, Lanarkshire) are added. The mixture has proved particularly useful for cleaning old instruments to be transferred from theatre stock to the Centre stock. Ultrasonic cleaning of such instruments may take several hours and the instruments often require repair.

8. DRYING CABINET (AMSCO EUROP Model D500)

The cabinet measures 23½ in. (59·5 cm.) in length, 33 in. (84 cm.) from back to front, and 25 in. (63·5 cm.) in height.

Access to the drying chamber is provided through a hinged lid in the counter top.

Air is drawn from the room by a powerful fan through an easily cleanable coarse filter fitted on the front panel of the cabinet. The air is driven through a finned electric heater (thermostatically controlled) to the bottom of the chamber, where it is divided into two streams running up through the chamber floor via slots on each side. The hot air leaves the chamber through a vent near the top of the back wall.

Preliminary trials with the drier indicated that the hot air current was by-passing the instruments loaded in a basket and placed in the drying chamber. It had already been found that the baskets (supplied with the ultrasonic washing machine) were much too deep, 11 in. (28 cm.), for the number of instruments that could be effectively cleaned in the Hobart washing machine. It was therefore possible to remedy the defect in the design of the drying cabinet by halving the height of the stainless steel baskets to $5\frac{1}{2}$ in. (14 cm.) and placing a piece of wood boarding on top of the baskets in the chamber. The board fits the breadth of the chamber but is short enough in length to leave a space at the back; this allows the main current of air to pass through the load of instruments in the basket, along the under side of the board towards the back of the chamber, and so to the outside via the vent. It was found that the drying effect of the hot air current could be enhanced by raising the basket off the floor of the chamber so that the top of the basket was almost level with the chamber vent; a suitably designed stainless steel frame to support the basket in this position was made for the purpose.

The drying time normally allowed is five minutes.

9. INSPECTION AND SORTING BENCH

The bench is constructed in stainless steel and the working surface consists of a thick slab of hard rubber. The length is $71\frac{1}{2}$ in. (182 cm.), the breadth 24 in. (61 cm.), and the height 34 in. (86·5 cm.). From the back of each side of the bench a vertical supports a transverse bar running along the whole length of the bench at 16 in. (40·6 cm.) above the back edge of the working surface. The bar supports 4 by $\frac{1}{4}$ in. (10·2 by 0·64 cm.) prongs in 14 pairs pointing forwards and upwards with $1\frac{1}{2}$ in. (3·8 cm.) between the prongs of each pair and $2\frac{1}{2}$ in. (6·35 cm.) between the pairs. Instruments such as artery forceps are hung on the sorting prongs after inspection.

Experience has shown that the inspection and sorting bench is unnecessarily complicated. All that is required is a suitable number of mobile sorting frames (see below) and trolleys for all sizes of tray.

10. MOBILE SORTING FRAMES (Plate 7)

The frames are constructed of 1 in. (2·54 cm.) diameter aluminium painted steel tubing. There are two 56 in. (142 cm.) vertical side pieces supporting a transverse stainless steel shelf measuring 62 by 12 in. (157 by 30·5 cm.). The verticals are supported at the bottom by welded-on 20 in. (50·8 cm.) " T " pieces with 4 in. (10·2 cm.) diameter wheels on each end. Below the shelf there are two transverse bars at 4 in. (10·2 cm.) and 11 in. (28 cm.) respectively from the shelf. Each bar supports seven pairs of 4 in. (10·2 cm.) prongs pointing forwards and upwards. The prongs are set at 3 in. (7·6 cm.) between pairs and the distance between the prongs of a pair is 2 in. (5·1 cm.).

There are three mobile sorting frames in the Centre at present.

11. TRAY CLEANING AND STORAGE BENCH

The bench is constructed in stainless steel, the working surface measures 6 by 2 ft. (183 by 61 cm.) and the height is 31 in. (79 cm.). Between the working top and a shelf below there are 21 slots, each of which can accommodate a full-size tray.

In practice, the bench has proved to be of unnecessarily complicated construction. All that is required is a bench on which one or two trays can be damp dusted and left for a few minutes before being lifted to the tray-setting area.

12. SINK CABINET

The sink, together with the drainage areas on each side, is constructed in one piece. The sink measures 18 by 15 by 8 in. (45·7 by 38·1 by 20·4 cm.) deep. The overall size of the cabinet is 63 by 21 by 37 in. (160 by 53·4 by 94 cm.). There are two drawers and three cupboards below.

13. SUPPLEMENTARY PACK PREPARATION AREA

The pack assembly area accommodates Remploy storage shelving and two 4 by 2 by 3 ft. (122 by 61 by 91·5 cm.) high wooden packing trolleys with shelves below. The Remploy shelving is 13 ft. (396 cm.) wide, 2 ft. (61 cm.) deep, and 6 ft. (183 cm.) high, with five shelves. The back is closed with hardboard and the front is covered by roller blinds.

The packs and pack contents are listed in Kardex files kept in the packing area.

14. SOFT STORES AREA

Two 21 ft. (640 cm.) lengths of Remploy shelving are arranged in parallel with 50 in. (127 cm.) transit space between. Each length is 6 ft. (183 cm.) high and includes five shelves of 30 in. (76 cm.) depth. To provide access from both sides of the shelves, roller blinds are fitted on both sides of each 21 ft. (640 cm.) length. As additional storage accommodation there is a length of Remploy shelving, 5 ft. (152 cm.) wide, with 12 in. (30·5 cm.) deep shelves.

15. LINEN REPAIR AREA

Each of the two linen folding trolleys is made of wood 4 by 2 by 3 ft. (183 by 61 by 91·5 cm.) high with shelf below.

The linen inspection table is 3 ft. (91·5 cm.) high and has a 6 by 4 ft. (183 by 122 cm.) working top, in the centre of which there is a 27 by 24 in. (68·5 by 61 cm.) frosted-glass window fitted flush with the working surface; illumination is effected by strip lights in a box below the window.

The sewing machine table is 30 in. (76 cm.) high with a 6½ by 3 ft. (204 by 91·5 cm.) wooden working surface.

16. STERILIZING AREA (Plate 12)

In the Central Sterilization Department of the hospital a Drayton Castle high pre-vacuum dressing sterilizer with a 26 by 26 by 36 in. (66 by 66 by 91·5 cm.) chamber is used for the sterilization of the trays. To allow the sterilization of five full-size trays during each sterilizing run, the chamber is fitted with four shelves each having a condensate drain underneath; the drains slope downwards to one or other side of the chamber in order to prevent drips of condensate from the lower surface of a tray above wetting a tray below.

In order to permit planned maintenance and to allow for the occasional breakdown, it is essential to have a second sterilizing chamber fitted with the necessary shelves and condensate drains.

17. PROCESSED STORES AREA

For sterile tray storage there is a cupboard 19 ft. 8 in. (600 cm.) long, 5 ft. 9 in. (175 cm.) high, and 25 in. (63·5 cm.) deep, with free access by four double doors to seven shelves giving eight 7½ in. (19 cm.) loading spaces running the full length of the cupboard.

For sterile packs there are four 26 in. (66 cm.) deep open shelves occupying a space 11 ft. 4 in. (345 cm.) long and 5 ft. high.

For labelling the shelves of trays and packs, coloured P.V.C. tape stamped by a Dymo Tapewriter is used.

Experience suggests that the amount of central storage space provided is only slightly generous for the trays and packs required for three general surgical theatres.

18. STERILE TRAY AND PACK DELIVERY TRUCK (STERILIZATION TRUCK)

The truck consists of a closed aluminium cabinet with one shelf on 9 in. (23 cm.) diameter sprung wheels. The length is 48 in. (122 cm.), the width 26 in. (66 cm.), and the height 25 in. (63·5 cm.). Wide double doors on each side expose the whole of the interior.

APPENDIX 4

SPECIFICATION OF LINEN, DRESSINGS, AND BANDAGES

SECTION I—LINEN (used as patient drapes, tray covers, and pack wraps)

Name of Article	Size after Shrinking (in inches)	Code Name (also used as pack label)
Cotton, Green		
Extra large	74 by 60	ExL
Large	54 by 54	L
Medium	48 by 36	M
Small	36 by 36	S
Leggings	See note below	Leg
Thyroid Drape		Thyroid
Mayo Table Cover		Mayo
Small Wrapper	24 by 24	Wrap
Twill, Blue		
Extra large	74 by 60	BExL
Large	54 by 54	BL
Medium	48 by 36	BM
Small	36 by 36	BS
Small Wrapper	24 by 24	B Wrap
Terry Towelling, Green		
Large	36 by 27	TTL
Small	18 by 18	TTS
Terry Towelling, Red		
Large	36 by 27	Red TTL
Small	18 by 18	Red TTS

NOTES—

(*a*) *Leggings.*—Roughly " mutton joint " shape with open end concave and measuring 24 in. across after laundering. On each side of the open end there is an 8 in. square patch pocket sewn on in such a way that the surgeon's hands inside point towards the open end of the legging. From one side of the open end the legging is straight and 47 in. in length. From the other side the legging curves very convexly to join the apex at a direct distance of 40 in.

(*b*) *Thyroid Drape.*—After laundering the length is 88 in. and the breadth 74 in. At the head end there is a neck " cut-out " 10 in. broad and $8\frac{1}{2}$ in. deep. Round the neck cut-out there is a double-thickness " yoke " $4\frac{1}{2}$ in. wide.

(*c*) *Mayo Table Cover.*—The shape is that of a pillow slip. The length after shrinkage is 41 in. and the breadth 22 in. The upper surface is double-thickness cloth stretching over 24 in. from the closed end.

SECTION II—DRESSINGS

Type of Dressing	Size (in inches)	Specification
With Radio-opaque Filament		
Swab, large	4 by 4	32 ply
Swab, small	3 by 3	36 ply
Dissecting Swabs	$1\frac{1}{2}$ by 1	...
Pledget, large	1 by $\frac{2}{5}$	...
Pledget, small	$\frac{1}{2}$ by $\frac{2}{5}$	...
Gauze Roll Pack	72 by 3	Rolled with 16 in. tape at inner end of roll
Muslin Pack	15 by 12	With 16 in. tape attached to a corner
Without Radio-opaque Filament		
Dressing Swabs	4 by 4	32 ply. Blue coloured
Gauze Tissue Pad	11 by 8	...

SECTION III—BANDAGES

Type of Bandage—	Sizes—
Crepe	2, 3, 4, and 6 in.
Kling	2, 3, 4, and 6 in.
Plain Tape	$\frac{1}{4}$ in. by 3 ft.
Ribbon Gauze	1 in. by 3 ft.
Tube Gauze	No. 12—5 ft.
Tube Gauze	No. 34—5 ft.
Stockinet	3, 6, and 8 in.—3 ft.
Perforated Oil Silk	18 by 18 in. sheet.
V.V. Felt	$\frac{5}{16}$ in. thick, $1\frac{1}{4}$ in. wide, 3 ft. long.

APPENDIX 5

COMPOSITION OF TRAYS AND PACKS

SECTION I—TRAYS

	Size of Tray	For Contents see Page No.
Large Basic	Full	45
Medium Basic	Full	46
Small Basic	Half	47
Amputation	Half	47
Anal	Half	48
Bladder	Half	49
Bouginage, Chiene's	Half	49
Bouginage, Hindman's	Half	50
Bouginage, Lister's	Half	50
Bronchoscopy	Half	51
Catheterization	Half	51
Chest Aspiration	Quarter	52
Dressing/Stitch	Quarter	52
Gall Bladder/Common Bile Duct	Quarter	53
Gastro-Intestinal Anastomosis	Half	53
Intravenous Cut Down	Quarter	54
Local Anaesthetic	Quarter	54
Long Instruments	Quarter	55
Neck and Thyroid	Full	55
Perineal Dissection	Quarter	56
Renal	Quarter	56
Rib Resection	Half	56
Skin Biopsy	Quarter	57
Skin Graft	Half	58
Tracheostomy	Half	59
Varicose Veins	Quarter	60

NOTES—

(*a*) *Packaging*

Size of Tray	*Size of Cover* Inner	Outer
Full (2 by 2 ft.)	ExL	BExL
Half (2 by 1 ft.)	L	BL
Quarter (1 by 1 ft.)	M	BM

(*b*) Where Bard Parker knife handles are included in a tray, together with a blade, a square of Vapour Phase Inhibition Paper (Leonard Stace Ltd., Gloucester Road, Cheltenham, England) is placed flat under the blade to prevent corrosion during autoclaving. Where a Bard Parker knife handle is included without a blade in certain trays, the theatre use whichever size and shape of pre-packed sterile blade is desired. The blades used are Swann Morton.

" Arbrasilk " is supplied as black non-capillary braided silk suture material by Armour Pharmaceutical Co. Ltd., Eastbourne, England, in 25-yard lengths within a heat-resistant plastic holder. The free end of the silk protrudes through an aperture in the holder. The manufacturer claims that the silk will withstand fifty sterilization runs. We have found that the reel is finished before it has been autoclaved fifty times and none of the users has found that the silk is unsatisfactory after repeated sterilization.

LARGE BASIC TRAY

Tray Size 2 by 2 ft.

INSTRUMENTS

4 Moynihan's Double Tetra Towel Clips.
8 Bachaus Towel Clips, 5 in.
5 Rampley's Sponge Forceps, 9½ in.
1 pair Long Tongs, 12 in.
1 pair Medium Tongs, 9 in.
1 Waugh's Dissecting Forceps, non-toothed, 8 in.
1 Heavy Dissecting Forceps, non-toothed, 6 in.
1 Waugh's Dissecting Forceps, 1/2 teeth, 8 in.
3 Lane's Dissecting Forceps, 2/3 teeth, 6 in.
2 B.P. Handles No. 4, 5 in., Blade No. 24.
3 pairs Mayo's Scissors, Straight, 6½ in.
1 pair Mayo's Scissors, Curved, 6½ in.
1 pair Metzenbaum Scissors, 7 in.
1 pair Mayo-Harrington Scissors, 9 in.
20 Crile's Artery Forceps, Curved, 6 in.
15 Mayo Artery Forceps, Curved, 7 in.
4 Allis Tissue Forceps.
1 Mayo's Needle-holder, 6½ in.
2 Mayo's Needle-holders, 8 in.
1 Diathermy Pencil, Lead and Blade.
1 Deaver's Retractor, 2 in. Blade.
1 Deaver's Retractor, 1½ in. Blade.
2 Kocher's Retractors, Large.
2 Langenbeck Retractors, Large.
2 Volkmann 4-prong Blunt Rakes.
1 Copper Spatula, 1 in.—2 in.
4 Spring Clips for holding: Disposal Bag.
Diathermy Lead.
Suction Tubing.

UTENSILS

3 Gallipots.
1 Kidney Dish, 10 in.
1 Bowl.
1 Kidney Dish, 8 in.

LINEN

2 Ex L.
1 Mayo.
6 S.
4 T.T.S.

SWABS

Large Basic Pack.

EXTRAS

1 Throat Swab.
1 Disposal Bag.
1 Arbrasilk Reel, Black, 25 yards.

MEDIUM BASIC TRAY

Tray Size 2 by 2 ft.

INSTRUMENTS

2 Moynihan's Double Tetra Towel Clips.
6 Bachaus Towel Clips, 5 in.
4 Rampley's Sponge Forceps, 9½ in.
1 pair Medium Tongs, 9 in.
1 Waugh's Dissecting Forceps, non-toothed, 8 in.
1 Waugh's Dissecting Forceps, 1/2 teeth, 8 in.
2 Lane's Dissecting Forceps, 2/3 teeth, 6 in.
2 B.P. Handles No. 4, 5 in., Blade No. 24.
2 pair Mayo's Scissors, Straight, 6½ in.
1 pair Mayo's Scissors, Curved, 6½ in.
1 pair Metzenbaum Scissors, 7 in.
15 Crile's Artery Forceps, Curved, 6 in.
8 Mayo's Artery Forceps, Curved, 7 in.
4 Allis Tissue Forceps.
1 Mayo's Needle-holder, 6½ in.
2 Mayo's Needle-holders, 8 in.
1 Diathermy Pencil, Lead and Blade.
2 Kocher's Retractors, Medium.
2 Langenbeck Retractors, Large.
2 Volkmann 4-prong Blunt Rakes.
1 Copper Spatula, 1 in.—2 in.
4 Spring Clips for holding: Disposal Bag.
Diathermy Lead.
Suction Tubing.

UTENSILS

3 Gallipots.
1 Kidney Dish, 10 in.
1 Bowl.
1 Kidney Dish, 8 in.

LINEN

2 Ex L.
1 Mayo.
6 S.
4 T.T.S.

SWABS

20—4 in. by 4 in.
5 Blue.

EXTRAS

1 Throat Swab.
1 Disposal Bag.
1 Arbrasilk Reel, Black, 25 yards.

SMALL BASIC TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS

3 Rampley's Sponge Forceps, 9½ in.
5 Shardle's Towel Clips, 3½ in.
1 B.P. Handle No. 4, 5 in., Blade No. 24
1 B.P. Handle No. 3, 5 in.
1 pair Mayo's Scissors, Straight, 6½ in.
1 pair Mayo's Scissors, Curved, 6½ in.
1 pair Metzenbaum Scissors, 7 in.
10 Crile's Artery Forceps, Curved, 6 in.
3 Mayo's Artery Forceps, Curved, 7 in.
4 Allis Tissue Forceps.
1 Mayo's Needle-holder, 6½ in.
2 Gillies Skin Hooks.
1 West's Mastoid Retractor.
2 Langenbeck Retractors, Small.
1 Lane's Dissecting Forceps, 2/3 teeth, 6 in.
1 Waugh's Dissecting Forceps, 1/2 teeth, 6 in.
1 Heavy Dissecting Forceps, non-toothed, 6 in.
1 Waugh's Dissecting Forceps, non-toothed, 6 in.
1 Silver Probe, 8 in.
1 Lister's Sinus Forceps, 5 in.
1 Volkmann Scoop, Double-ended.
1 Spring Clip for holding Disposal Bag.

UTENSILS

2 Gallipots. 1 Kidney Dish, 10 in.

LINEN

1 L. 4 S.

SWABS

20—4 in. by 4 in. 5 Blue.
1 Ribbon Gauze, 1 in. Roll—3 ft.

EXTRAS

1 Throat Swab. 1 Disposal Bag.
1 Arbrasilk Reel, Black, 25 yards.

AMPUTATION TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS

1 Farabeuf's Periosteal Elevator.
1 Farabeuf's Rugine.
1 Van Havre's Bone Nibbling Forceps, 9½ in.
1 Double-action Bone-cutting Forceps, 9½ in.
1 Liston's Bone-cutting Forceps, 6 in.
1 Necrosis Forceps, 7¾ in.
1 Tubby's Bone File, 8 in.
1 Metal Ruler, 12 in.
1 Gigli Saw, 50 cm.
1 Syme's Amputation Knife, 6½ in.
1 Amputation Saw, 9 in.

LINEN

1 L.

EXTRAS

2 Crepe Bandages, 6 in. 4 Gamgee (20 by 12 in.).

ANAL TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS

3 Rampley's Sponge Forceps, 9½ in.
6 Shardle's Towel Clips, 5 in.
1 B.P. Handle No. 4, 5 in., Blade No. 24.
1 B.P. Handle No. 3, 5 in.
1 pair Mayo's Scissors, Straight, 6½ in.
1 pair Mayo's Scissors, Curved, 6½ in.
10 Crile's Artery Forceps, Curved, 6 in.
5 Mayo's Artery Forceps, Curved, 7 in.
1 Mayo's Needle-holder, 6½ in.
2 Lane's Dissecting Forceps, 2/3 teeth, 6 in.
1 Heavy Dissecting Forceps, non-toothed, 6 in.
1 pair Medium Tongs, 9 in.
1 Diathermy Pencil, Lead and Blade.
1 Silver Probe, 8 in.
1 Park's Anal Retractor.
1 Gabriel's Proctoscope.
2 Spring Clips for holding: Diathermy Lead.
Disposal Bag.

UTENSILS 1 Kidney Dish, 10 in. 2 Gallipots.

LINEN 3 S. 2 T.T.S. 2 Leg.

SWABS 20—4 by 4 in. 5 Blue. 2 Gauze Tissue Pads.

EXTRAS 1 Throat Swab. 1 Disposal Bag. 1 T-Bandage.

BLADDER TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS
1 pair Mayo-Harrington Scissors, 9 in.
1 Millin's Vulsellum Forceps, 5/16 in.
3 Lister's Bougies, sizes 8/11, 10/13, 12/15.
2 Morris's Retractors, Blade 2 in.
1 Diathermy Pencil, Lead with 1 Button and 1 Loop.
1 pair Long Tongs, 12 in.
1 Curved Foley Catheter Introducer.
1 Thomson-Walker Bladder Retractor.
1 Posterior Blade for Bladder Retractor.
1 Anterior Wall Blade for Bladder Retractor.
2 pairs Lateral Swivel Blades for Bladder Retractor.
1 Lithotomy Forceps.
1 Spring Clip for holding Diathermy Lead.

UTENSILS
1 Kidney Dish, 10 in.
1 Kidney Dish, 8 in.
1 Jug.

SWABS
3 Gauze Roll Packs.

EXTRAS
2 Gate Clips.
2 Safety Pins.
2 Portex Connections.
2 Carl Dakin Syringes with Bulbs.

N.B.—Each Carl Dakin syringe is wrapped in 1 T.T.S. for protection. 1 L Drape is placed on top before folding over inner cover.

BOUGINAGE TRAY—CHIENE'S

Tray Size 2 by 1 ft.

INSTRUMENTS
17 Chiene's Bougies, sizes 2/4—18/20.
1 Millar's Staff.
1 Spring Clip for holding Disposal Bag.

UTENSILS
1 Gallipot.
1 Kidney Dish, 10 in.

LINEN
3 S.

SWABS
10—3 by 3 in.

EXTRAS
1 Disposal Bag.
1 Cap for Duncaine Gel Tube.

N.B.—Uppermost on the tray when the inner cover is opened, a gown, cap, mask, and Kleenex hand towel, will be presented.

BOUGINAGE TRAY—HINDMAN'S

Tray Size 2 by 1 ft.

INSTRUMENTS 13 Hindman's Bougies, sizes 3/6—27/30.
1 Spring Clip for Disposal Bag.

UTENSILS 1 Gallipot. 1 Kidney Dish, 10 in.

LINEN 3 S.

SWABS 10—3 by 3 in.

EXTRAS 1 Disposal Bag. 1 Cap for Duncaine Gel Tube.

N.B.—Uppermost on the tray when the inner cover is opened, a gown, cap, mask, and Kleenex hand towel, will be presented.

BOUGINAGE TRAY—LISTER'S

Tray Size 2 by 1 ft.

INSTRUMENTS 12 Lister's Bougies, sizes 2/5—13/16.
1 Millar's Staff.
1 Spring Clip for holding Disposal Bag.

UTENSILS 1 Gallipot. 1 Kidney Dish, 10 in.

LINEN 3 S.

SWABS 10—3 by 3 in.

EXTRAS 1 Disposal Bag. 1 Cap for Duncaine Gel Tube.

N.B.—Uppermost on the tray when the inner cover is opened, a gown, cap, mask, and Kleenex hand towel, will be presented.

BRONCHOSCOPY TRAY—ADULT

Tray Size 2 by 1 ft.

INSTRUMENTS
1 Negus Adolescent Bronchoscope, fitted with light carrier and bulb.
1 Extra Light Carrier fitted with a bulb.
1 Metal Suction Tube.
1 Bronchoscope Flex.
1 Suction Tubing—3 ft.
3 Spring Clips for holding: Disposal Bag.
Suction Tubing.
Flex.

UTENSILS
1 Bowl.
1 Gallipot.

LINEN
3 S.

SWABS
10—3 by 3 in.

EXTRAS
1 Disposal Bag.

N.B.—Uppermost on the tray when the inner cover is opened, a gown, cap, mask, and Kleenex hand towel, will be presented.

CATHETERIZATION TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS
1 Mayo's Artery Forceps, Straight, 7 in.
1 Foley Catheter Introducer, Curved.
1 Foley Catheter Introducer, Straight.
1 Spring Clip for holding Disposal Bag.

UTENSILS
1 Kidney Dish, 10 in.
1 Kidney Dish, 8 in.
2 Gallipots.

LINEN
3 S.

SWABS
10—3 by 3 in.

EXTRAS
2 McCartney Bottles.
1 Disposal Bag.
2 Gate Clips.
1 Cap for Duncaine Gel Tube.

N.B.—Uppermost on the tray when the inner cover is opened, a gown, cap, mask, and Kleenex hand towel, will be presented.

CHEST ASPIRATION TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS, ETC.

1 Rampley's Sponge Forceps, 9½ in.
1 Labat's Syringe, 10 c.c.
1 Labat's Needle, 4 in., 20 G.
1 Labat's Needle, 2 in., 22 G.
1 Labat's Needle, 13/16 in., 23 G.
1 Martin's Aspirating Syringe, 20 ml.
1 2-way Tap.
1 Martin's Aspirating Needle.
2 Martin's Trocars and Cannulae.
1 Rubber Tubing, 18 in., with Metal Sinker.
1 Spring Clip for holding Disposal Bag.

UTENSILS 2 Gallipots. 1 Jug—1 pint.

LINEN 3 S.

SWABS 10—3 by 3 in.

EXTRAS 1 Throat Swab. 1 Disposal Bag. 1 McCartney Bottle.

N.B.—Uppermost on the tray when the inner cover is opened, a gown, cap, mask, and Kleenex hand towel, will be presented.

DRESSING—STITCH TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS

2 Rampley's Sponge Forceps, 9½ in.
4 Shardle's Towel Clips, 3½ in.
1 B.P. Handle No. 3, 5 in.
1 pair Stitch Scissors, 5 in.
1 pair Mayo's Scissors, Straight, 6½ in.
5 Crile's Artery Forceps, Curved, 6 in.
1 Heavy Dissecting Forceps, non-toothed, 6 in.
1 Waugh's Dissecting Forceps, 1/2 teeth, 6 in.
2 Bryant's Dressing Forceps, 5 in.
1 Mayo's Needle-holder, 6½ in.
1 Spring Clip for holding Disposal Bag.

UTENSILS 1 Kidney Dish, 8 in. 2 Gallipots.

LINEN 4 S.

SWABS 20—3 by 3 in. 5 Blue.
2 Gauze Tissue Pads. 1 Ribbon Gauze, 1 in. Roll, 3 ft.

EXTRAS 1 Throat Swab. 1 Disposal Bag. 2/0 Black Silk—8 ft.

N.B.—1 Kleenex hand towel is folded and placed on top of the drapes.

GALL BLADDER—COMMON BILE DUCT TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS

1 B.P. Handle No. 3, 9 in.
1 Naunton Morgan Needle-holder, 10 in.
2 Wilkie's Cholecystectomy Forceps.
2 O'Shaughnessy's Forceps, 8 in.
1 Desjardin's Calculus Forceps.
1 Nelson's Aneurysm Needle—Right.
1 Nelson's Aneurysm Needle—Left.
4 Lister's Bougies—Sizes 4/7—7/10.
1 Oschner's Gall Bladder Trocar and Cannula—14FG.
1 Moynihan's Malleable Scoop/Probe.
1 Cheatle's Gall Stone Scoop/Hook.

UTENSILS

1 Gallipot.

EXTRAS

Plain Tape, $\frac{1}{4}$ in.—3 ft.
1 Gate Clip.
1 Ampoule File.
2 Safety Pins.

N.B.—1 Large Drape is placed on top of the instruments before folding over inner cover.

GASTRO-INTESTINAL ANASTOMOSIS TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS

1 Large Payr's Crushing Clamp.
2 Medium Payr's Crushing Clamps.
2 Small Payr's Crushing Clamps.
2 Doyen's Light Occlusion Clamps, Straight.
2 Doyen's Light Occlusion Clamps, Curved.
4 Shoemaker Clamps.
*1 Diathermy Pencil, Lead and Needle Point.
*1 B.P. Handle No. 4, 5 in., Blade No. 24.
*1 B.P. Handle, No. 3, 5 in.
*1 pair Mayo's Scissors, Straight, $6\frac{1}{2}$ in.
*2 Crile's Artery Forceps, Straight, 6 in.
*6 Babcock's Tissue Forceps.
*1 Mayo's Needle-holder, $6\frac{1}{2}$ in.
*1 Mayo's Needle-holder, 8 in.
*1 Spring Clip for holding Diathermy Lead.

UTENSILS

1 Anastomosis Tray (Lightweight, office-type wire basket, covered with 1 large red Terry towel).
(This tray holds instruments marked *.)
1 Kidney Dish, 10 in.

LINEN

1 Red T.T.L.
4 Red T.T.S.

I.V. CUT-DOWN TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS
1 B.P. Handle No. 3, 5 in.
1 pair Stitch Scissors, 5 in.
3 Halstead's Mosquito Artery Forceps, Curved, 5½ in.
1 Waugh's Dissecting Forceps, non-toothed, 6 in.
1 Waugh's Dissecting Forceps, 1/2 teeth, 6 in.
1 Small's Aneurysm Needle, 6 in.
1 Hook, Sharp, 6 in.
1 Kilner's Apicoectomy Retractor.
1 Spring Clip for holding Disposal Bag.

UTENSILS 1 Gallipot. 1 Kidney Dish, 8 in.

LINEN 3 S.

SWABS 10—3 by 3 in. 2 Blue Swabs.

EXTRAS
1 Disposal Bag.
2/0 Black Silk—8 ft.
4/0 Black Silk—8 ft.
2 Coates' Skin Needles, 3 in.
1 Very Fine Straight Cutting Needle, 2½ in.

N.B.—Uppermost on the tray when the inner cover is opened, a gown, cap, mask, and Kleenex hand towel will be presented.

LOCAL ANAESTHETIC TRAY

Tray Size 1 by 1 ft.

SYRINGES AND NEEDLES
2 Labat's Syringes, 10 c.c.
2 Labat's Needles, 4 in., 20 G.
2 Labat's Needles, 2 in., 22 G.
1 Labat's Needle, 13/16 in., 23 G.
1 Spring Clip for holding Disposal Bag.

UTENSILS 2 Gallipots.

LINEN 2 S.

SWABS 10—3 by 3 in.

EXTRA 1 Disposal Bag.

N.B.—1 Kleenex hand towel is folded and placed on top of the drapes.

LONG INSTRUMENTS TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS
1 B.P. Handle No. 3, 9 in.
1 pair Metzenbaum Scissors, 10½ in.
1 pair Ganglionectomy Scissors, Curved, 11 in.
1 Naunton-Morgan Needle-holder, 10 in.
5 Lloyd Davies Artery Forceps, 10 in.
3 Ganglionectomy Forceps, 10 in.
2 Ganglionectomy Nerve Hooks, 10 in.
1 Nelson Roberts Dissecting Forceps, 9 in.

EXTRA
1 Plain Tape—3 ft.

N.B.—1 Large Drape is placed on top of the instruments before folding over the inner cover.

NECK AND THYROID TRAY

Tray Size 2 by 2 ft.

INSTRUMENTS
6 Bachaus Towel Clips, 5 in.
4 Rampley's Sponge Forceps, 9½ in.
1 pair Medium Tongs, 9 in.
2 Leedham Green Dissecting Forceps, non-toothed, 6½ in.
4 Lane's Dissecting Forceps, 2/3 teeth, 6 in.
2 B.P. Handles No. 4, 5 in., Blade No. 24.
2 B.P. Handles No. 3, 5 in., Blade No. 10.
3 pair Mayo's Scissors, Straight, 6½ in.
30 Crile's Artery Forceps, Curved, 6 in.
5 Mayo's Artery Forceps, Curved, 7 in.
4 Allis Tissue Forceps.
2 Mayo's Needle-holders, 6½ in.
2 Gillies' Skin Hooks.
1 Syme's Aneurysm Needle, 6 in.
1 Diathermy Pencil, Lead and Blade.
1 Joll's Self-retaining Retractor.
2 Mouse-tooth Dissecting Forceps.
2 Rows Michel Clips—12 mm.
1 Michel Clip Insertor.
2 Spring Clips for holding: Disposal Bag.
Diathermy Lead.

UTENSILS
3 Gallipots.
1 Kidney Dish, 10 in.
1 Bowl.
1 Kidney Dish, 8 in.

LINEN
1 Thyroid.
2 T.T.S.
1 Mayo.
2 S.
1 Head Drape (1 M and 1 S folded).

SWABS
60—3 by 3 in.
5 Blue.

EXTRA
1 Disposal Bag.

N.B.—Additional Retractors will be on this tray.

PERINEAL DISSECTION TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS
1 Solid Blade Scalpel, No. 4.
1 Liston's Bone Cutting Forceps, 6 in.
2 Allis Tissue Forceps.
1 Vulsellum Forceps, 5/16 in.
1 Slessor's Retractor.

LINEN 2 Leg.

EXTRAS 2 Gauze Tissue Pads. 1 T-Bandage.

RENAL TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS
1 Thomson Walker Kidney Pedicle Clamp.
1 Pott's Angled Clamp, 8 in.
2 O'Shaughnessy Artery Forceps, 8 in.
1 Set Randal's Renal Calculi Forceps, 4 sizes.
4 Lister's Bougies, sizes 4/7—7/10.
1 Moynihan's Malleable Scoop/Probe.

EXTRA 1 Plain Tape, $\frac{1}{4}$ in.—3 ft.

N.B.—1 large drape is placed on top of the instruments before folding over the inner cover.

RIB RESECTION TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS
1 Semb's Rib Raspatory No. 3.
1 Doyen's Rib Raspatory.
1 pair Nelson Roberts' Scissors, 9 in.
1 Nelson Roberts' Dissecting Forceps, 9 in.
5 Nelson Roberts' Artery Forceps, 9 in.
1 pair Tudor-Edward Double Action Rib Shears.
1 Crafoord's Rib Approximator.
1 Price-Thomas Rib Spreader.
6 Blades for Rib Spreader.
1 Key for Blades.

LINEN 2 T.T.S.

N.B.—1 large drape is placed on top of the instruments before folding over the inner cover.

SKIN BIOPSY TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS

2 Rampley's Sponge Forceps, 9½ in.
4 Shardle's Towel Clips, 3½ in.
2 B.P. Handles No. 3, 5 in.
1 Gillies' Dissecting Forceps, 1/2 teeth, 6 in.
1 McIndoe's Dissecting Forceps, non-toothed, 6 in.
1 Heavy Dissecting Forceps, non-toothed, 6 in.
1 pair Stitch Scissors, 5½ in.
1 pair Metzenbaum Scissors, 7 in.
8 Halstead's Mosquito Artery Forceps, Curved, 5½ in.
2 Allis Tissue Forceps.
1 Mayo's Needle-holder, 6½ in.
2 Gillies' Skin Hooks.
1 Spring Clip for holding Disposal Bag.

UTENSILS

2 Gallipots.
1 Kidney Dish, 8 in.

LINEN

4 S.

SWABS

20—3 by 3 in.
2 Blue.
1 Gauze Tissue Pad.
1 Kling Bandage, 2 in.

EXTRA

1 Disposal Bag.

SKIN GRAFT TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS

4 Rampley's Sponge Forceps, 9½ in.
8 Shardle's Towel Clips, 3½ in.
1 B.P. Handle No. 4, 5 in., Blade No. 24.
1 B.P. Handle No. 3, 5 in.
1 pair Stitch Scissors, 5½ in.
2 pairs Mayo's Scissors, Straight, 6½ in.
5 Halstead's Mosquito Artery Forceps, Curved, 5½ in.
1 Gillies' Needle-holder.
1 Mayo's Needle-holder, 6½ in.
2 Gillies' Skin Hooks.
2 Hooks, Sharp, 6 in.
2 Lane's Double-ended Retractors.
1 Lane's Dissecting Forceps, 2/3 teeth, 6 in.
1 Gillies' Dissecting Forceps, 1/2 teeth, 6 in.
1 Heavy Dissecting Forceps, non-toothed, 6 in.
1 McIndoe's Dissecting Forceps, non-toothed, 6 in.
1 Spring Clip for holding Disposal Bag.

UTENSILS

3 Gallipots.
1 Kidney Dish, 8 in.
1 Kidney Dish, 10 in.

LINEN

3 L. 6 S.

SWABS

20—3 by 3 in.
5 Gauze Tissue Pads.
1 Kling Bandage, 4 in.
10 Blue.
3 Crepe Bandages, 4 in.
1 Kling Bandage, 2 in.

EXTRAS

1 Throat Swab.
1 Disposal Bag.
1 Needle, Straight Cutting, Fine, 2½ in.

N.B.—Skin graft boards to be added to this tray

TRACHEOSTOMY TRAY

Tray Size 2 by 1 ft.

INSTRUMENTS

2 Rampley's Sponge Forceps, 9½ in.
5 Shardle's Towel Clips, 3½ in.
1 B.P. Handle No. 4, 5 in., Blade No. 24.
1 B.P. Handle No. 3, 5 in., Blade No. 11.
1 pair Stitch Scissors, 5½ in.
1 pair Mayo's Scissors, Straight, 6½ in.
1 pair Metzenbaum Scissors, 7 in.
10 Crile's Artery Forceps, Curved, 6 in.
2 Mayo's Artery Forceps, Curved, 7 in.
2 Allis Tissue Forceps.
1 Mayo's Needle-holder, 6½ in.
1 Waugh's Dissecting Forceps, 1/2 teeth, 6 in.
1 Waugh's Dissecting Forceps, non-toothed, 6 in.
2 Langenbeck's Retractors, Small.
1 West's Mastoid Retractor.
1 Tracheal Hook, Sharp, 6 in.
1 Tracheal Hook, Blunt, 6 in.
2 Gillies' Skin Hooks.
1 Bowlby Tracheal Dilator.
1 Nosworthy Mount.
1 Catheter Mount and Tubing, 6 in.
1 McGill's T-Connection.
1 Cap for T-Connection.
1 Gate Clip.
2 Portex Connections.
1 Spring Clip for holding Disposal Bag.

UTENSILS

2 Gallipots. 1 Kidney Dish, 8 in.

LINEN

1 L. 4 M.

SWABS

20—3 by 3 in. 5 Blue.
1 Plain Tape, ½ in.—3 ft.

SUTURES

1 Hank No. 2 Ligature Silk. 1 Hank No. 4 Ligature Silk.
4/0 Black Silk—8 ft. 2/0 Black Silk—8 ft.

NEEDLES (Threaded in V.P.I. Paper.)

1 No. 11, Half Circle Round Bodied.
1 Colt's Tension Curved, 4 in.
1 Coates' Skin Curved Extra Fine, 3 in.
1 Straight Cutting Fine, 2½ in.
1 Straight Cutting Extra Fine, 3 in.

EXTRA

1 Disposal Bag.

N.B.—Placed on top of the drapes and before inner cover is folded over:
3 Gowns. 2 Caps. 2 Masks. 6 Kleenex hand towels.

VARICOSE VEINS TRAY

Tray Size 1 by 1 ft.

INSTRUMENTS

2 Rampley's Sponge Forceps, $9\frac{1}{2}$ in.
4 Shardle's Towel Clips, $3\frac{1}{2}$ in.
1 B.P. Handle No. 4, 5 in., Blade No. 24.
1 Small's Aneurysm Needle, 6 in.
1 Babcock's Vein Stripper (3 parts).
4 Acorns for Babcock's Vein Stripper.

EXTRAS 2 Crepe Bandages, 6 in. 2 Gamgee (20 by 6 in.).

N.B.—1 large drape is placed on top before folding over the inner cover.

A Nabatoff's vein stripper will be added to this tray when supplied by the manufacturer.

SECTION II—SUPPLEMENTARY INSTRUMENT PACKS

Pack—	*Contents*
Balfour's S.R. Retractor.	1 Balfour's Self-retaining Retractor with Centre Blade.
Cope's Clamp.	1 Zachary Cope's Anastomosis Clamp. 1 Lever. Either 3, 4, 5 or 6 segments.
Crile's Artery Forceps, Curved.	10 Crile's Artery Forceps, Curved.
Crile's Artery Forceps, Straight	10 Crile's Artery Forceps, Straight.
Deaver's Retractors.	1 Deaver's Retractor (Blade 1½ in.). 1 Deaver's Retractor (Blade 2 in.).
Diathermy Set.	1 Diathermy Lead. 1 Diathermy Pencil. 1 Blade. 1 Loop. 1 Button. 1 Needle (threaded through V.P.I. Paper). } Placed in small white bag. 1 Spring Clip for holding Lead.
Dott's Clamp.	1 Dott's Twin Anastomosis Clamp.
Doyen's L/O Clamps.	2 Doyen's Light Occlusion Clamps, Curved. 2 Babcock's Tissue Forceps.
Fontaine's Clamp.	1 Fontaine's Twin Anastomosis Clamp (Abadie's).
Friedrich's Stitching Clamp.	1 Friedrich's Stomach and Intestine Suturing Apparatus. 3 Interchangeable Magazines, each holding Clips.
General Bundle.	1 Greville-McDonald Dissector. 1 Volkmann Scoop, Double Ended. 1 Lister's Sinus Forceps. 1 Silver Probe, 8 in.
Kelley's Liver Retractor.	1 Kelly's Liver Retractor.
Krause Laryngeal Pack.	1 Krause Laryngeal Forceps. 5 Dissecting Swabs.
Lane's Clamp, Curved.	1 Lane's Twin Anastomosis Clamp, Curved.
Lane's Clamp, Straight.	1 Lane's Twin Anastomosis Clamp, Straight.
Mastectomy Set.	4 Lane's Tissue Forceps. 4 Allis' Tissue Forceps. 1 Large Drape. 8 Gauze Tissue Pads. 2 Crepe Bandages, 6 in.
Mayo's Artery Forceps, Curved.	5 Mayo's Artery Forceps, Curved.
Michel's Clip Set.	1 Childe's Approximating Forceps with fixed neck to hold Michel Clips. 1 Childe's Approximating Forceps. 1 Michel's Clip Inserting Forceps. 1 Michel's Clip Extracting Forceps. 2 Rows Michel's Clips, 16 mm.

SUPPLEMENTARY INSTRUMENT PACKS (Contd.)

Pack—	*Contents*
Millin's Bladder Retractor.	1 Millin's Bladder Retractor plus Centre Blade.
Minor Amputation.	1 Liston's Bone Cutting Forceps. 1 Small Bone Nibblers. 1 Greville-McDonald Dissector.
Mosquito Artery Forceps.	6 Halstead's Mosquito Artery Forceps, Curved. 4 Halstead's Mosquito Artery Forceps, Straight.
Moynihan's Cholecystectomy Forceps.	2 Moynihan's Cholecystectomy Forceps.
Retropubic Prostatectomy Set.	2 Millin's T-Capsule Forceps. 1 Millin's Vulsellum Forceps, 5/16 in. 1 Millin's Boomerang Needle-holder. 1 Millin's Ligature Carrier.
Riche's Artery Forceps.	1 Riche's Artery Forceps. 1 Cable.
Right-angled Rectal Clamps.	2 Fraser's Right-angled Clamps. 1 Finch's Right-angled Clamp.
Slessor's Retractor.	1 Slessor's Retractor.
Swanson's Clamp.	1 Swanson's Clamp. 2 Holding Forceps.
Wilson Hey's Diathermy Artery Forceps.	1 Wilson Hey's Diathermy Artery Forceps, 7 in. 1 Cable.

NOTE—	*Packaging*	*Size of Cover*	
		Inner	*Outer*
	All packs.	Wrap.	B Wrap

SECTION III—SPECIAL INSTRUMENT PACKS

Pack—	*Contents*
Alexis-Thomson Retractor.	2 Alexis-Thomson Retractors.
Anastomosis.	2 O'Shaughnessy Artery Forceps (Light Pattern). 1 Tracheal Hook, Blunt, 6 in. 1 Bryant's Dressing Forceps.
Anastomosis Trim.	1 Fagge's Aural Forceps. 1 pair Strabismus Scissors. 1 Bryant's Dressing Forceps.
Catheter Packet, Stage 1.	2 Green S. 6 Blue Swabs. 1 Thomson-Walker Penile Clamp. 1 Cap for Duncaine Gel Tube. 1 Gallipot, 3 in. 1 Kleenex Hand Towel, Large.
Cholangiogram Set No. 1.	3 Syringes each 20 ml. 1 Pentothal Cannula, 15 G., 4 in. 2—20 G., 4½ in. Needles. 1—18 G., 1¾ in. Needle. 1—15 G., 4¾ in. Needle. 1—16 Needle. Each syringe is wrapped in an Inco paper tissue and the needles are threaded through a similar tissue. The cannula is packed in a 5 by 5 in. paper bag.
Cholangiogram Set No. 2.	2 Syringes, each 20 ml. 1 Pentothal Cannula, 15 G., 4 in. 2 Special Cannulae. 1—2-way Tap. 1 Portex Cannula, FG 4—White. 1 Portex Cannula, FG 5—Red. 1 Portex Cannula, FG 6—Yellow. Each Portex cannula has a special right-angled needle attached. Other than the syringes which are wrapped in Inco tissues, these items are packed in 5 by 5 in. white paper bags.
Durham Rake Retractor.	1 Durham Rake Retractor.
General Extras.	2 Shoehorn Retractors. 1 Jean's Dissecting Forceps. 1 Appendix Invaginator.
Large Retractors.	1 Modified Deaver's Retractor (Blade 1½ in.). 1 Modified Deaver's Retractor (Blade 2 in.).
Right-angled Retractors.	4 Right-angled Retractors.
Kelly-Fraser Artery Forceps.	10 Kelly-Fraser Artery Forceps, Curved. 10 Kelly-Fraser Artery Forceps, Straight.

NOTE—

Packaging	*Size of Cover*	
	Inner	*Outer*
Catheter Packet Stage 1.	S.	BS.
Cholangiogram Set 1.	TTS.	B Wrap.
Cholangiogram Set 2.	TTS.	B Wrap.
All other packs.	Wrap.	B Wrap.

SECTION IV—SUPPLEMENTARY LINEN PACKS

	Contents
Extra Large.	1 EXL.
Large.	1 L.
Medium.	4 M.
Small.	4 S.
Terry Towelling, Large.	2 TTL.
Terry Towelling, Small.	4 TTS.
Terry Towelling, Red.	1 Red TTL. 4 Red TTS.
Legging.	2 Leg.
Mayo Table Cover.	1 Mayo.
Head Drape.	1 M, 1 S.
Thyroid Drape.	1 Thyroid.

NOTE—

Packaging	*Size of Cover*	
	Inner	*Outer*
Medium Drape Pack.	S.	BS.
Thyroid Drape Pack.	S.	BS.
All other packs.	Wrap.	B Wrap.

SECTION V—GOWN PACKS

Type of Pack—	*Contents*	*Packaging Size of Cover*	
		Inner	*Outer*
Five-gown pack.	4 large gowns. 1 small gown.	M.	BM.
Single-gown pack.	1 large gown.	S.	BS.

NOTE.—Two Kleenex paper hand towels are packed for each gown. When the outer blue wrap of the five-gown pack is unfolded, a paper hand towel is presented on top so that the scrub nurse can dry her hands before opening the inner green wrapper. The small gown is packed on top of the four large gowns. The 19 by 16 in. Kleenex hand towels are supplied by Kimberley Clark Ltd. already folded—without extra charge for folding.

SECTION VI—SUPPLEMENTARY UTENSIL PACKS

Type of Pack—	*Contents*	*Packaging Size of Cover*	
		Inner	*Outer*
Basin	1 Basin, 12 in.	S.	S.
Bowl.	1 Bowl, 6 in.	Wrap.	B Wrap.
Jug.	1 2-pint Jug.	Wrap.	B Wrap.
Kidney Dish.	1 Kidney Dish, 10 in.	Wrap.	B Wrap.
Gallipot.	1 Gallipot, 3 in.	Inco Tissue.	Inco Tissue.

SECTION VII—SUPPLEMENTARY DRESSING PACKS

Manufacturer's Code No.—	*Contents*
E.D.1.	30 Swabs, Large. 10 Dissecting Swabs. 2 Gauze Roll Packs. 2 Muslin Packs. 5 Dressing Swabs, Blue.
E.D.4.	10 packets each containing 10 Swabs, Large.
E.D.5.	50 packets each containing 5 Dissecting Swabs.
E.D.6.	50 packets each containing 10 Pledgets, Large.
E.D.7.	50 packets each containing 10 Pledgets, Small.
E.D.8.	10 packets each containing 1 Gauze Roll Pack.
E.D.9.	10 packets each containing 1 Muslin Pack.
E.D.11.	10 packets each containing 5 Dressing Swabs, Blue.
E.D.12.	10 packets each containing 10 Swabs, Small.
Gauze Tissue Pack.	5 Gauze Tissue Pads.

NOTE.—Packs E.D.1 to E.D.12 are supplied in sets ready for use by Vernon and Co. Ltd. Packs E.D.8 and E.D.9 are also made up in the Theatre Service Centre from salvaged material. The Gauze Tissue Pack is made up in the Theatre Service Centre and is wrapped in an inner green cotton small wrapper (Wrap) with an outer blue twill small wrapper (B Wrap).

SECTION VIII—SPECIAL DRESSING PACK

	Contents	*Packaging*	
		Inner	*Outer*
Burns Pack	30 Dressing Swabs, Blue. 4 Bandages, Crepe, 6 in. 2 Bandages, Crepe, 4 in. 4 Bandages, Kling, 4 in. 2 Gauze Rolls, White, 12 by 18 in. 6 Gamgee Tissues, 18 by 12 in. 5 ft. Tube Gauze No. 12. 5 ft. Tube Gauze No. 34. 2 Large Green Drapes (L). 4 Small Green Drapes (S). 1 Throat Swab.	M.	BM.

SECTION IX—SUPPLEMENTARY BANDAGE PACKS

	Contents	*Notes*
Crepe No. 2.	2 Crepe Bandages, 2 in.	(*a*)
Crepe No. 3.	2 Crepe Bandages, 3 in.	(*a*)
Crepe No. 4.	2 Crepe Bandages, 4 in.	(*b*)
Crepe No. 6.	2 Crepe Bandages, 6 in.	(*b*)
Kling No. 2.	2 Kling Bandages, 2 in.	(*a*)
Kling No. 3.	2 Kling Bandages, 3 in.	(*a*)
Kling No. 4.	2 Kling Bandages, 4 in.	(*b*)
Kling No. 6.	2 Kling Bandages, 6 in.	(*b*)
Plain Tape.	3 ft. Plain Tape.	(*c*)
Ribbon Gauze.	3 ft. Ribbon Gauze.	(*c*)
Tube Gauze No. 12.	5 ft. Tube Gauze No. 12.	(*c*)
Tube Gauze No. 34.	5 ft. Tube Gauze No. 34.	(*c*)
Stockinet.	3 ft. Stockinet, 3 in. 3 ft. Stockinet, 6 in. 3 ft. Stockinet, 8 in.	(*d*)
Perforated Oil Silk.	1 Sheet.	(*b*) (*e*)
VV Felt.	2 pieces.	(*b*)

NOTES—

Paper " Inco Cleaning Tissues " (11 by 8 in.) and " Clinical Sheets " (18 by 12 in.) are supplied by Robinson and Sons, Chesterfield.

(*a*) Packs marked (*a*) are wrapped in 2 Inco Tissues.

(*b*) Packs marked (*b*) are wrapped in 2 Clinical Sheets.

(*c*) Packs marked (*c*) are wrapped in 2 half Inco Tissues.

(*d*) The stockinet pack is wrapped in an inner green cotton small cover (S) with an outer blue twill small cover (BS).

(*e*) The perforated oil silk sheet is folded with two Kleenex paper towels in order to separate the layers of oiled silk.

APPENDIX 6

PROGRESSIVE USE OF TRAYS—AUGUST 1964 TO JANUARY 1965

Tray	Number Used						
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Total
Large Basic . .	19	38	60	53	80	89	339
Medium Basic . .	17	60	54	76	75	90	372
Small Basic . .	5	22	27	38	37	48	177
Amputation . .	...	...	...	1	3	3	7
Anal	6	5	4	8	7	13	43
Bladder . . .	4	5	8	7	6	8	38
Bouginage (Lister's) .	...	...	...	...	...	3	3
Bronchoscopy . .	...	...	...	...	...	2	2
Catheterization . .	...	...	...	...	1	35	36
Chest Aspiration .	...	...	...	...	1	3	4
Dressing, Stitch . .	...	13	23	19	17	18	90
Gall Bladder/Common Bile Duct . .	6	7	12	13	14	14	66
Gastro-intestinal Anastomosis . .	5	24	28	32	36	40	165
Local Anaesthetic .	...	...	1	...	4	5	10
Long Instruments .	...	...	5	16	25	29	75
Neck Thyroid . .	...	...	...	...	...	6	6
Renal . . .	...	5	4	2	3	5	19
Perineal Dissection .	...	...	3	3	3	1	10
Rib Resection . .	...	3	6	3	5	6	23
Skin Graft . . .	...	...	...	...	...	8	8
Tracheostomy . .	...	...	1	...	...	3	4
Varicose Veins . .	3	3	5	2	11	4	28
Skin Biopsy . .	...	...	...	...	...	10	10
Total Trays for Elective Operations . .	52	148	189	195	235	303	1,122
Total Trays for Emergency Operations .	13	37	52	78	93	140	413
Total Trays for all Operations . .	65	185	241	273	328	443	1,535

APPENDIX 7

USE OF TRAYS BY OPERATIONS PERFORMED—JANUARY 1965

Large Basic

Elective Operations 4
- Gastrotomy.
- Mastectomy.
- Refashioning of colostomy.
- Exploration of abdomen and insertion of drain.

Emergency Operations 10
- Repair of incarcerated femoral hernia.
- Laparotomy.
- Haemorrhage from femoral graft.
- Perinephric abscess.
- Repair of gastric ulcer.

Large Basic with Gastro-intestinal Anastomosis Tray

Elective Operations 18
- Gastrectomy.
- Carcinoma of stomach.
- Closure of colostomy.
- Laparotomy (? partial gastrectomy).
- Gastric ulcer.
- Colectomy.
- Obstruction.
- Hemicolectomy.

Emergency Operations 7
- Obstruction.
- ? Perforation. ? Pancreatitis.
- Hemicolectomy.
- Division of adhesions and appendicectomy.
- Partial gastrectomy.

Large Basic with Gall Bladder and Common Bile Duct Tray

Elective Operations 12
- Cholecystectomy.

Emergency Operations 1
- Cholecystectomy.

Large Basic with Gastro-intestinal Anastomosis and Gall Bladder and Common Bile Duct Trays

Elective Operations 1
- Laparotomy—jaundice.

Emergency Operations . . . . . Nil

Large Basic with Gastro-intestinal Anastomosis and Long Instruments Trays

Elective Operations 10
- Duodenal ulcer.
- Vagotomy, pyloroplasty.
- Gastric neoplasm.

Emergency Operations 1
- Wedge resection gastrectomy and vagotomy.

Large Basic with Long Instruments Tray

Elective Operations 16
Lumbar sympathectomy.
Vagotomy.
Duodenal ulcer.

Emergency Operations 2
Lumbar sympathectomy.
Hysterectomy.

Large Basic with Bladder Tray

Elective Operations 1
Excision of ureteric orifice tumour.

Emergency Operations . . . . . Nil

Large Basic with Rib Resection Tray

Elective Operations 1
Hiatus hernia—abdominal approach.

Emergency Operations . . . . . Nil

Large Basic with Rib Resection and Renal Trays

Elective Operations 4
Nephrectomy.

Emergency Operations 1
Excision of hypernephroma.

Medium Basic

Elective Operations 25
Hernia repairs.
Mastectomy.
Removal of abdominal packs.
Dissection of groin glands.
Closure of colostomy.
Oöphorectomy.
Appendicectomy.
Bilateral excision of hydrocele.

Emergency Operations 50
Appendicectomy.
Resuture of burst abdominal wound.
Drainage of subphrenic abscess.
Hernia repairs.
Salpingo-oöphorectomy.
Excision of strangulated omentum.

Medium Basic with Gastro-intestinal Anastomosis Tray

Elective Operations 1
Colostomy (resection of small bowel).

Emergency Operations 2
Strangulated hernia.

Medium Basic with Bladder Tray

Elective Operations 7
Prostatectomy.
Resection of bladder neck and removal of stones.

Emergency Operations . . . . . Nil

Medium Basic with Bouginage Tray (Lister's)

Elective Operations 1
Amputation of penis.

Emergency Operations . . . . . Nil

Medium Basic with Amputation Tray

Elective Operations 2
Amputation of lower limb.

Emergency Operations 1
Amputation of lower limb.

Medium Basic with Perineal Dissection Tray

Elective Operations 1
Exploration of perineal sinus.

Emergency Operations . . . . . Nil

Small Basic

Elective Operations 25
Frozen section.
Excision of subcutaneous cyst.
Circumcision.
Orchidectomy.
Iliac crest biopsy.
Excision of parotid tumour.
Orchidopexy.
Gland biopsy.
Excision of mandibular abscess.
Testicular tumour.

Emergency Operations 15
Gland biopsy.
Removal of foreign body.
Incision of haematoma.
Suture of lacerations.
Excision of abscess.

Small Basic with Skin Graft Tray

Elective Operations 2
Skin graft.

Emergency Operations . . . . . Nil

Small Basic with Varicose Veins Tray

Elective Operations 4
Stripping and ligation of varicose veins.

Emergency Operations . . . . . Nil

Small Basic with Local Anaesthetic Tray

Elective Operations 1
Removal of sebaceous cyst.

Emergency Operations 1
Removal of cyst.

Anal Tray

Elective Operations 12
Haemorrhoidectomy.
Fissure in ano.
Excision of anal polyp.
Perianal sinus.

Emergency Operations 1
Dilatation of anal sphincter.

Neck and Thyroid Tray

Elective Operations 6
Thyroidectomy.

Emergency Operations . . . . . Nil

Local Anaesthetic Tray

Elective Operations 2
Nerve block.

Emergency Operations 1
Nerve block.

Tracheostomy Tray

Elective Operations 1
Tracheostomy.

Emergency Operations 2
Tracheostomy.

Chest Aspiration Tray

Elective Operations . . . . . Nil

Emergency Operations 3
Chest aspiration.
Drainage of hydrocele.

Catheterization Tray

Elective Operations 26
Bladder catheterization.

Emergency Operations 9
Bladder catheterization.

Skin Biopsy Tray

Elective Operations 4
Excision of small cyst.
Excision of naevus.
Exploration of face for foreign bodies.
Skin biopsy.

Emergency Operations 2
Papilloma of lip.
Scalene node biopsy.

Skin Graft Tray

Elective Operations 1
Skin graft.

Emergency Operations 1
Skin graft.

Skin Graft with Skin Biopsy Tray

Elective Operations 4
Excision of melanoma.
Skin graft.
Emergency Operations . . . . . Nil

Bouginage Tray (Lister's)

Elective Operations 1
Dilatation of urethra.
Emergency Operations 1
Dilatation of urethra.

Bronchoscopy Tray

Elective Operations 1
Bronchoscopy.
Emergency Operations 1
Bronchoscopy.

Dressing—Stitch Tray

Elective Operations 8
Skin graft dressings.
Removal of anal skin tag.
Biopsy of scrotum.
Opening colostomy.
Emergency Operations 10
Suture of lacerations.
Dressing of burns.
Drainage of abscess.

APPENDIX 8

VALUE OF INSTRUMENTS AND UTENSILS IN CIRCULATION AT 31st JANUARY 1965

Type of Package	No. of Packages in Circulation	Value of Instruments and Utensils per Pack	Total Value
I—Trays—		£ s. d.	£ s. d.
Large Basic	6	166 6 0	997 16 0
Medium Basic	8	119 12 6	957 0 0
Small Basic	5	68 18 11	344 14 7
Amputation	2	49 0 6	98 1 0
Anal	2	60 14 2	121 8 4
Bladder	3	48 14 6	146 3 6
Bouginage, Chiene's	1	22 8 4	22 8 4
Bouginage, Hindman's	1	15 19 4	15 19 4
Bouginage, Lister's	2	15 14 4	31 8 8
Bronchoscopy	4	15 19 0	63 16 0
Catheterization	3	4 12 2	13 16 6
Chest Aspiration	1	13 5 10	13 5 10
Dressing/Stitch	4	25 1 2	100 4 8
Gall Bladder/Common Bile Duct	3	36 7 0	109 1 0
Gastro-intestinal Anastomosis	4	136 1 9	544 7 0
Intravenous Cut-down	2	13 19 6	27 19 0
Local Anaesthetic	2	5 6 11	10 13 10
Long Instruments	4	69 2 0	276 8 0
Neck and Thyroid	2	118 16 0	237 12 0
Perineal Dissection	1	34 6 6	34 6 6
Renal	1	60 2 0	60 2 0
Rib Resection	2	93 2 4	186 4 8
Skin Biopsy	2	38 1 10	76 3 8
Skin Graft	1	49 18 9	49 18 9
Tracheostomy	4	60 5 8	241 2 8
Varicose Veins	3	10 14 6	32 3 6
			4,812 5 4
II—Supplementary Instrument Packs—			
Balfour's Self-retaining Retractor	5	13 0 0	65 0 0
Crile's Artery Forceps, Curved	8	11 15 0	94 0 0
Crile's Artery Forceps, Straight	2	11 5 0	22 10 0
Cope's Clamp	4	38 0 9	152 3 0
Deaver's Retractor	4	7 7 6	29 10 0
Diathermy Set	4	3 5 9	13 3 0
Dott's Clamp	3	12 12 0	37 16 0
Doyen's Light Occlusion Clamps	3	13 16 0	41 8 0
Fontaine's Clamp	3	26 15 6	80 6 6
Friedrich's Stitching Clamp	1	140 0 0	140 0 0
General Bundle	6	3 17 6	23 5 0
Kelly's Liver Retractor	3	6 12 0	19 16 0
Krause's Laryngeal Pack	4	3 1 0	12 4 0
Carried forward			£731 1 0

APPENDIX 8—*continued*

Type of Package	No. of Packages in Circulation	Value of Instruments and Utensils per Pack	Total Value
		£ s. d.	£ s. d.
Brought forward .			£731 1 0
Lane's Clamp, Curved .	1	24 10 0	24 10 0
Lane's Clamp, Straight .	2	23 0 0	46 0 0
Mastectomy Set. . .	3	14 9 11	43 9 9
Mayo's Artery Forceps, Curved	8	10 10 0	84 0 0
Michel's Clip Set . .	5	6 0 6	30 2 6
Millin's Bladder Retractor .	2	21 16 8	43 13 4
Minor Amputation . .	2	7 18 6	15 17 0
Mosquito Artery Forceps .	1	12 4 0	12 4 0
Moynihan's Cholecystectomy Set	2	12 0 0	24 0 0
Retropubic Prostatectomy Set	1	26 6 0	26 6 0
Riche's Artery Forceps .	2	6 0 0	12 0 0
Right-angled Rectal Clamps	1	24 5 0	24 5 0
Slessor's Retractor . .	3	23 0 0	69 0 0
Swanson's Clamp . .	4	26 10 0	106 0 0
Wilson Hey's Diathermy Artery Forceps . .	1	7 15 0	7 15 0
			1,300 4 1
III—Special Instrument Packs—			
Alexis Thomson Retractor .	3	10 0 0	30 0 0
Anastomosis . . .	1	9 3 0	9 3 0
Anastomosis, Trim . .	3	4 16 9	14 10 3
Catheter Packet, Stage 1 .	2	5 4 1	10 8 2
Cholangiogram, Set 1 . .	2	1 15 5	3 10 10
Cholangiogram, Set 2 . .	1	2 10 9	2 10 9
Durham's Rake Retractor .	2	3 13 6	7 7 0
General Extras . . .	3	9 0 0	27 0 0
Kelly Fraser Artery Forceps .	2	38 10 0	77 0 0
Large Retractors . . .	3	6 0 0	18 0 0
Right-angled Retractors. .	2	14 0 0	28 0 0
			227 10 0
IV—Supplementary Utensil Packs—			
Basin	18	1 13 7	30 4 6
Bowl	4	0 10 8	2 2 8
Jug	4	1 9 11	5 19 8
Kidney Dish . . .	4	0 12 6	2 10 0
Gallipot	8	0 5 1	2 0 8
			42 17 6
Summary—			
I—Trays	...	...	4,812 5 4
II—Supplementary Instrument Packs	...	...	1,300 4 1
III—Special Instrument Packs	...	...	227 10 0
IV—Supplementary Utensil Packs	...	...	42 17 6
Total Value .	...	...	£6,382 16 11

APPENDIX 9

VALUE OF LINEN IN CIRCULATION AT 31st JANUARY 1965

Type of Article	No. in Circulation (Dozen)	Value per Dozen	Total Value
Cotton, Green—		£ s. d.	£ s. d.
Extra Large	16½	9 12 0	158 8 0
Large	13½	6 3 0	83 0 6
Medium	21	4 6 0	90 6 0
Small	66	4 6 0	283 16 0
Mayo Table Cover	6	4 10 0	27 0 0
Legging	4½	4 16 0	21 12 0
Wrapper	18	2 14 0	48 12 0
Thyroid Drape	¾	10 0 0	7 10 0
Twill, Blue—			
Extra Large	7½	11 14 0	87 15 0
Large	9	9 0 0	81 0 0
Medium	15	7 10 0	112 10 0
Small	24	6 0 0	144 0 0
Wrapper	18	4 4 0	75 12 0
Terry-Towelling, Green—			
Large	3	6 6 0	18 18 0
Small	21	3 3 0	66 3 0
Terry-Towelling, Red—			
Large	3	6 18 0	20 14 0
Small	7½	3 9 0	25 17 6
Gowns—			
Large	25½	14 3 0	360 16 6
Small	6	12 16 0	76 16 0
			£1,790 6 6

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